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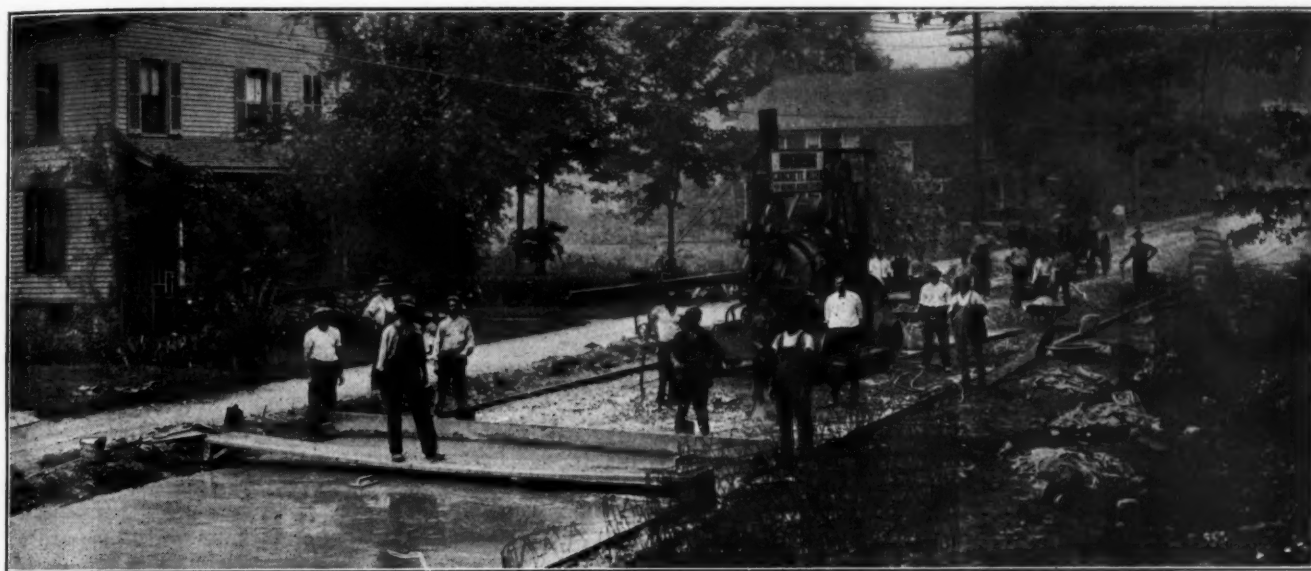


FIG. 1. MUNICIPAL FORCE OF NORWALK, CONN., BUILDING CONCRETE ROAD.

CONCRETE ROAD BUILDING IN NORWALK

Comparison of Pavements With and Without Reinforcement, on Streets With and Without Street Railway Tracks
—Handling Aggregates—Reinforcement—Expansion Joints—Organization of Force.

By C. A. BETTS.

There has been constructed in the city of Norwalk, Connecticut, within the past two years about 13,000 square yards of reinforced concrete and 18,000 square yards of plain concrete pavement. One of the plain concrete sections carries the through traffic between New York and Boston, and all the other new pavements are on radiating trunk lines within two miles of the center of the city. There is in these a considerable variety in conditions, and consequently in features of construction, due to the fact that parts of each of the two kinds of concrete roads are built on streets where there are trolley tracks and parts on untracked streets with maximum grades of 2.8 per cent. The first sections were laid in the summer of 1914.

The reinforced pavements have been built by the city as a part of the work of the Street Department and paid for by appropriations; while the plain concrete was laid, under contract, by the Hassam Company for the State Highway Department as State aid roads. Wherever the streets were car-tracked, the edges of the pavement were established eleven feet outside the rails on each side. Here the thickness was made 6 inches and the surface was carried to the level of the rail top on a parabolic curve having a crown of $2\frac{3}{8}$ inches, giving $8\frac{3}{8}$ inches of concrete at the center. Tracks and dummy, if any, were also crowned slightly. On the 18-foot pavements the parabolic surface was given a 2-inch crown (approximately $1/100$ of the total width), which made the total thickness of con-

crete at the center 8 inches, the edges of this also being 6 inches, thus allowing interchanging of forms.

Especially care was taken in the preparation of the sub-grade. All sub-grades were rolled level with 10-ton or 15-ton machines. (In retamping the ties to grade after two weeks' exposure to summer heat, it was found that the disturbance of uncovered relaid tracks by street car traffic depended on the expansion at curves caused by temperature changes rather than on the traffic itself). The sub-grade was extended about 8 inches on either side to support 4 by 6 inch timber forms. No difficulty was found in obtaining a very regular shoulder-edge with these forms; even on curves, where 2 by 6-inch planks were substituted. Also 4-inch width gave adequate support for the finishers' bridge, which extended from form to form.

On all work there was used $1\frac{1}{2}$ -inch "run-of-the-crusher" stone that had been well screened of dust, and special Long Island concrete sand meeting state highway specifications. A large part of the materials was placed on the finished sub-grade before mixing was begun, and the same team that supplied cement could easily haul in any additional sand or stone as needed. The sand was piled on the opposite side of car tracks from the mixer and stone, and the bridge shown in Fig. 3 was designed to afford easy crossing. This bridge, the ones used by the finishers, the concrete mixer and forms constituted the principal additional outlay over and above the regular

equipment required of the city in doing its own work. Depreciation on all equipment is included in the estimated cost of the work.

A1:2:4: mix, turned out by a Koehring No. 16, boom and bucket distributing, paving mixer, was adopted and rigorously adhered to with very satisfactory results. Box wheel-barrows, built to hold two cubic feet, insured accurate measurements. The sloping fronts (Fig. 2) facilitated dumping into the hopper.

Undoubtedly the placing of the concrete plays an important part in the success of the finished pavement. In this the city had the advantage of experienced concrete handlers and finishers, with the result that, instead of the imperfections ordinarily found in the early sections of a new kind of work, all was uniform. The surface was struck with a steel edged template (a special one being used for the tracks) and finished with wooden hand floats (Fig. 3). It was then broomed transversely to present a dull, rough appearance. Two years' wear has not entirely removed the broom marks. The finishers worked from a plank bridge which, on streets where there were tracks, was centrally supported on a car built of two pairs of 15-inch flanged wheels with axles 4-feet 6-inches apart from which a frame of 4 by 4 timbers was underslung to carry the bridge. With skilled concrete workers and a dependable mixer, operations were reduced to organizing and cost-minimization.

There were, however, two undetermined factors—the reinforcement and spacing of joints. Results of experiments on these are being closely watched. Two sizes of triangle mesh reinforcement made by the American Steel and Wire Co., known as Nos. 7 and 29, were used. These gave cross-sectional areas of .041 and .49-inch respectively per foot width of pavement and this has proven sufficient for the prevention of temperature cracks. It required two men to cut and lay strips across from form to form or form to rail as the case might be. Little difficulty was experienced in keeping the reinforcement two inches below the finished surface. Unless the reinforcement extends over the ends of the ties nearly to the rails, there is a tendency for cracks to form parallel with the rails and about two feet outside. Comparison of the uncracked reinforced portions with the unreinforced tracks, where many irregular hair-cracks show, seems to justify the additional cost of nine cents per square yard for reinforcement.

Like reinforcement, the joints must meet local conditions. Transverse joints have been spaced both 25 and 35

feet apart, and filled with two thicknesses of two-ply tar paper. Fig. 3 shows the divided float used at these joints. Although 35-foot spacing meets average requirements, it is evidently unnecessarily close when sub-grade conditions are favorable.

One team, with driver and helper, brought the cement, of which two bags were used to a batch. Three barrows of stone per batch were furnished by six men, and two barrows of sand by a shoveler. An engineer and fireman operated the mixer. Four placers spread the concrete as it was distributed by boom and bucket, two men placed the reinforcement, two others acted as finishers, two placed and removed the forms; and a chief finisher and foreman completed the gang. With this organization and a half-yard mixer, the run for an 8-hour day averaged 550 square yards of finished concrete on the 18-foot pavement and 460 square yards on the tracked streets.

Newly-laid concrete was covered with earth reserved from sub-grading, allowed to cure ten days and then brushed clean and trimmed before being opened to traffic.

While there can be no direct comparison between the plain and reinforced pavements so differently built, nevertheless this much is evident: that the parts laid by the Hassam process of rolling cement grout into placed crushed stone have cracked irregularly every ten to ninety feet, as have also those tracks and dummies on reinforced streets where neither joints nor reinforcement were provided. In the latter case the cracks, none of which will admit a knife blade, came opposite the joints outside the rails as well as at frequent intermediate points, seeming to indicate that one joint serves the purpose of several natural expansion cracks. Then there is the added advantage of regularity in favor of joints.

To date no appreciable difference is noticeable between

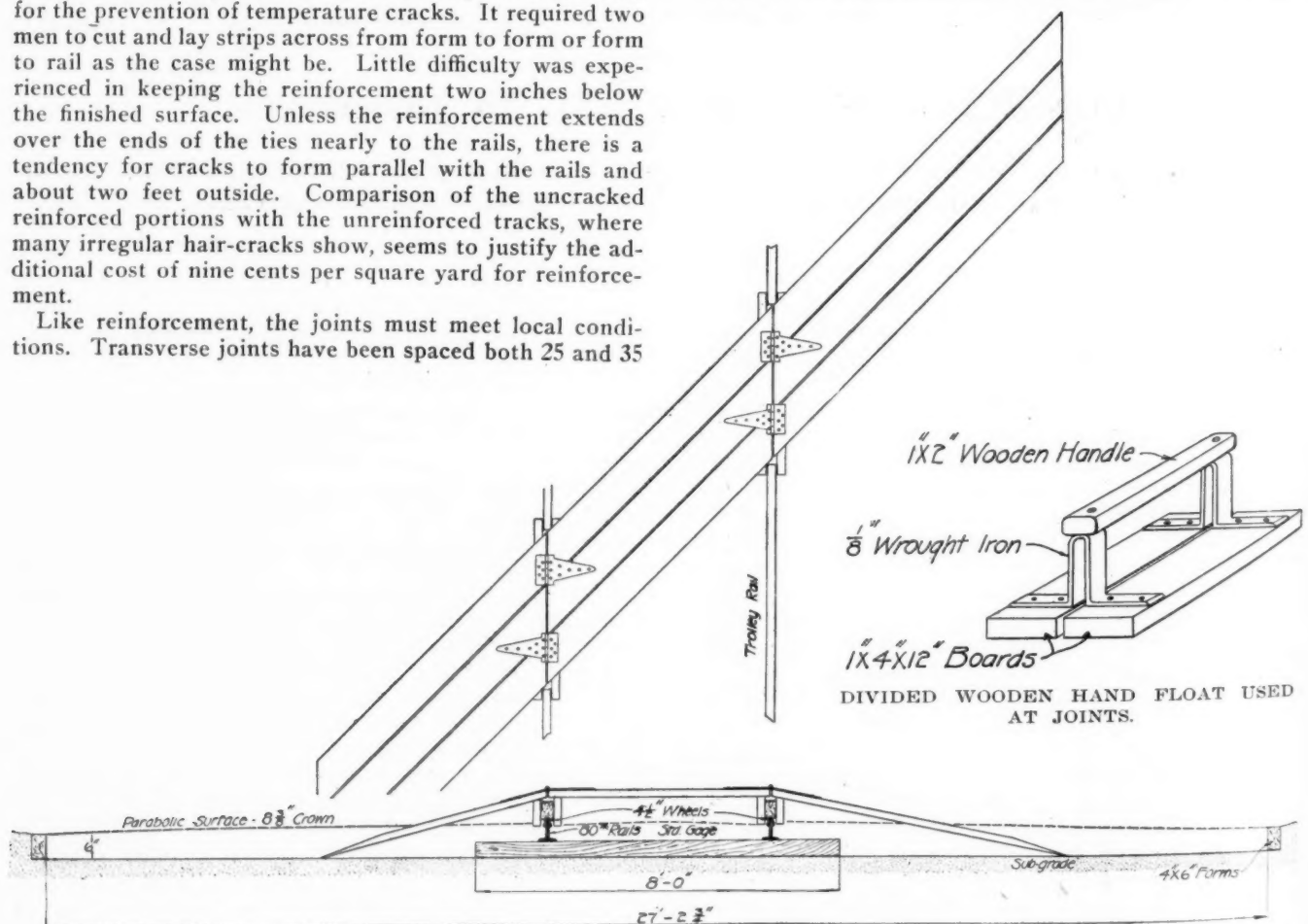


FIG. 3. BRIDGE FOR SAND BARROWS.



FIG. 2. LOADING CONCRETE MIXER. BRIDGE OVER TRACK FOR BARROWS AT THE RIGHT.

the pavements down two winters and those down one, except that the expansion joints of the former will need redressing this season—the only maintenance required. But experience gained from two years' observation cannot be taken as a final criterion of the pavements' value until corroborated by further examination at the end of five or six years when final adjustment within the concrete has taken place.

MILWAUKEE'S NEW MUNICIPAL STREET LIGHTING SYSTEM*

Details of Underground Circuits—Lamp Transformers —Extent and Cost of Proposed Installation— Estimate of Operating Costs

By F. H. BERNHARD.

Fully 88 per cent of the new system will be supplied from underground circuits. Only in the outlying districts, where streets are unpaved and without established grade, will overhead construction be used until the streets are paved. The city has been divided into 59 compact circuit areas, near the center of each of which the distribution lines of the electric lighting company are tapped through a simple outdoor or pile type substation which is entirely automatic. All the energy supplied is metered. There is a self-wound time switch, which automatically closes and opens the lighting circuit at the proper time. The circuits are well protected by lightning arresters, primary fuses and circuit breakers. From each circuit transformer, one side of which is grounded, runs the secondary circuit as a series circuit to all the lighting units. The conductor for this circuit is a steel-armored lead-covered cable buried about 15 inches below ground surface, usually in the parkway just back of the curb, but occasionally in a narrow cut in the pavement close to the curb where cement sidewalks extend to the curb. No underground conduit is used except that where streets and alleys are crossed a two-inch iron pipe is driven below the pavement by means of hydraulic pipe pushers and the cable pulled through this.

The lamps are not connected directly to this cable, but to the secondaries of individual lamp transformers placed in series with the cable and buried at the foot of the post. These lamp transformers serve to supply 20 amperes to the larger lamps from the 6.6-ampere series circuit, they maintain continuity in this circuit when lamps are burned out or broken, and they also protect the post and lamp from the high voltage. There are several safeguards to minimize the possibility of serious circuit failure.

All circuits are laid out in the most direct lines. Boundaries of circuit areas are mostly on important streets, with the two sides of these streets fed from the



MAP OF CITY SHOWING THE 59 CIRCUIT AREAS.

*Continued from page 648.

adjoining circuits to minimize complete cutting off of the light if one circuit should fail.

In the demonstration installation the full number of lamps ultimately called for has not been installed on the less important streets. The program is to finish most of the underground work and set the more important lighting units first and next year add the intermediate units, which can be done easily. Even now the illumination furnished by less than the full number of new units is vastly superior to that formerly provided. In the old system the 5,746 lamps in use aggregated 956,580 candle-power, or an average of 167 c.p. per unit. In the new system the 8,821 units (9,344 lamps) will aggregate 3,409,550 c.p., or an average of 387 c.p. per unit. Thus the new system will furnish about $3\frac{1}{2}$ times as much total light. Several square miles in the outskirts of the city will be lighted for the first time. These improvements, together with the numerous others already alluded to, will be provided at an increase in total annual lighting cost of about 42 per cent.

Even with this increase, the total annual cost of street lighting in Milwaukee will be only \$0.77 per capita, compared with \$0.84, which is the average cost in the group of 13 cities having a population of 300,000 to 600,000. At present Milwaukee has the lowest annual cost of all these cities of its class, which partly accounts for the meagerness of its lighting.

Cost of Street Lighting in the Thirteen United States Cities Having Between 300,000 and 600,000 Population.

City	Population in 1915	Street-Lighting Cost in 1915	
		Total	Per Capita
Baltimore, Md.	584,605	\$571,190	\$0.98
Pittsburgh, Pa.	571,984	527,817	.92
Detroit, Mich.	554,717	361,349	.65
Los Angeles, Cal.	475,367	435,454	.92
Buffalo, N. Y.	461,335	497,190	1.08
San Francisco, Cal.	456,009	435,000	.95
Milwaukee, Wis.	428,062	232,910	.54
Cincinnati, O.	406,706	399,422	.98
Newark, N. J.	399,000	267,030	.67
New Orleans, La.	350,695	*278,363	*.79
Washington, D. C.	358,679	380,225	1.06
Minneapolis, Minn.	353,460	312,193	.88
Jersey City, N. J.	300,133	164,607	.55
Average			\$0.84

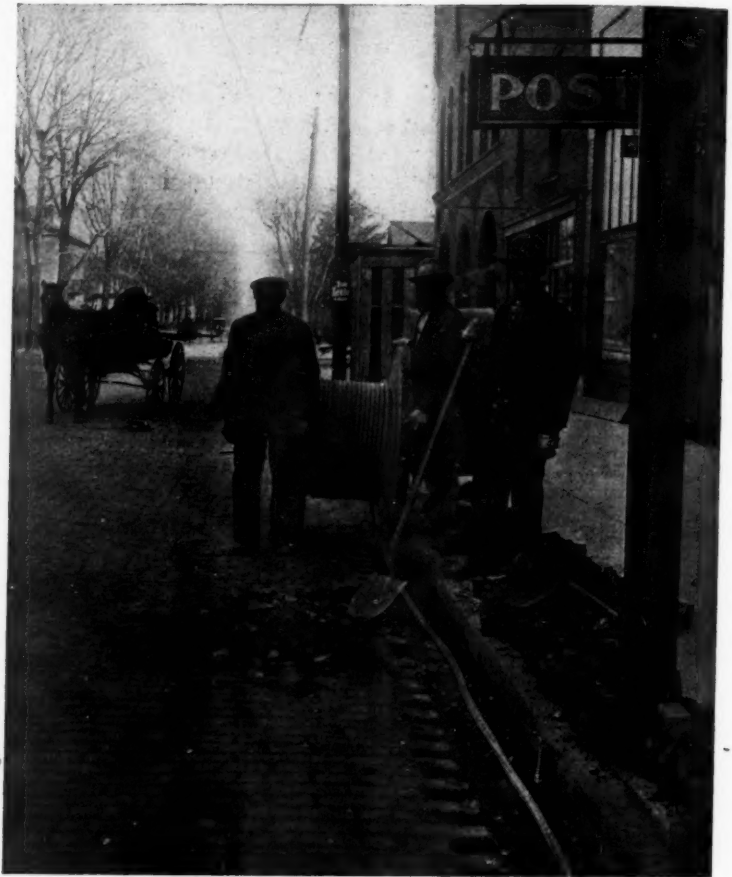
*Figures for 1915 not obtainable; figures given are for 1912.

The installation cost of the completed system, as revised for price of materials prevailing Jan. 1, 1916, is given in the following table:

Quantity.	Item.	Cost.
7,322	Electric lamps	\$18,091
9,344	Lanterns or fixtures	159,705
8,821	Lamp supports:	
3,452	15-ft. posts	\$114,779
1,924	22.5-ft. single bracket posts	72,612
142	22.5-ft. double bracket posts	5,697
2,499	22.5-ft. suspension posts	184,926
429	30-ft. single bracket posts	22,531
362	30-ft. double bracket posts	19,910
13	45-ft. bracket posts	11,581
		422,036
6,799	Wiring lamp supports	43,234
2,022	Gas connections	18,076
6,802	Lamp transformers	95,122
456,011	ft. cable under pavement	200,108
1,137,709	ft. cable under parkway	311,358
211,385	ft. overhead lines	29,581
59	Sets circuit control apparatus	32,585

Total installation cost.....\$1,329,896

The annual lighting costs consist of three elements:



LAYING CABLE UNDER BRICK PAVEMENT.

energy, maintenance, and investment charges. The first covers cost of gas and electricity; it is expected to purchase gas at 45 cents per 1,000 cu. ft. and electricity at one cent per kilowatt-hour. Maintenance of electric lamps will be taken care of by the city, and of gas lamps by the gas company under a special contract. The investment charges cover interest and a sum to retire one-twentieth of the bonds each year. A summary of the annual lighting cost is given in the following table:



CONNECTING POST WITH CABLE.
Lamp transformer is connected to series circuit cable and lamp cable.

Details of Annual Operating Cost as Estimated for Milwaukee's New Lights.

No. of Units	No. and Candle-power of Lamps	Type of Unit	Annual Cost per Unit			Total Annual Cost
			Energy	Maintenance	Investment	
2,022	1	15 -ft. Concrete post, gas.....	\$ 8.39	\$ 12.50	\$ 4.71	\$ 25.60
1,015	1	15 -ft. Concrete post, electric.....	3.28	10.08	11.44	24.80
415	1	15 -ft. Concrete post, electric.....	7.08	11.88	11.54	30.50
266	1	22.5-ft. Suspension.....	7.08	11.88	14.33	33.29
50	1	22.5-ft. Concrete post, single bracket.....	7.08	11.88	11.29	30.25
32	1	30 -ft. Concrete post, single bracket.....	7.08	11.88	13.25	32.21
2,219	1	22.5-ft. Suspension.....	11.17	14.69	14.48	40.34
1,036	1	22.5-ft. Concrete post, single bracket.....	11.17	14.69	11.45	37.31
35	1	30 -ft. Concrete post, single bracket.....	11.17	14.69	13.40	39.26
59	2	30 -ft. Concrete post, double bracket.....	14.16	23.76	15.57	53.49
13	1	22.5-ft. Suspension.....	12.87	17.14	14.54	44.55
751	1	22.5-ft. Concrete post, single bracket.....	12.87	17.14	11.49	41.50
323	1	30 -ft. Concrete post, single bracket.....	12.87	17.14	13.45	43.46
13	2	30 -ft. Concrete post, double bracket.....	22.34	29.38	15.85	67.57
6	2	45 -ft. Concrete post, double bracket.....	22.34	29.38	21.04	72.76
1	1,000	Special Suspension.....	20.35	19.68	14.66	54.69
87	1	22.5-ft. Concrete post, single bracket.....	20.35	19.68	11.63	51.66
39	1	30 -ft. Concrete post, single bracket.....	20.35	19.68	13.59	53.62
34	2	22.5-ft. Concrete post, double bracket.....	25.74	34.28	13.29	73.31
42	2	30 -ft. Concrete post, double bracket.....	25.74	34.28	15.94	75.96
4	2	45 -ft. Concrete post, double bracket.....	25.74	34.28	21.14	81.16
108	1	22.5-ft. Concrete post, double bracket.....	33.22	36.82	13.47	83.51
248	2	30 -ft. Concrete post, double bracket.....	40.70	39.36	16.16	96.22
1	4	45 -ft. Concrete post, four bracket.....	51.48	68.56	29.50	149.54
2	4	45 -ft. Concrete post, four bracket.....	81.40	78.72	29.95	190.07
8,821						\$326,846.00



SAMPLE OF ARMORED UNDERGROUND CABLE USED.

This is the type of cable most largely used for the underground street lighting circuits. In some cases, two conductor cable is employed, each conductor being embedded in rubber, and hence amply insulated from the other.

Electricity	\$79,269
Gas	16,965
Total annual energy cost.....	\$96,234
Maintenance, gas	\$24,264
Maintenance, electric; materials and supplies	64,174
Maintenance, electric; labor.....	35,927
Maintenance, service; laboratory.....	8,333
Total annual maintenance cost.....	\$132,698
Interest on 4½% 20-year bonds (average)....	\$31,419
Cancellation of bonds.....	66,495
Total annual investment cost.....	97,914
Total annual cost.....	\$326,846

1. Impregnated Jute.
2. Double Layer Impregnated Paper.
3. Steel Tape, 1/32 inch thick.
4. Steel Tape, 1/32 inch thick.
5. Double Layer Impregnated Paper.
6. Lead Sheath.
7. Impregnated Cotton Tape.
8. Rubber Insulation.
9. Stranded Copper Conductor.

As fast as the new system is being put in it is expected to order the removal of all private or merchants' lamp posts along the streets. By special arrangements the merchants will be able to secure somewhat increased lighting from the municipal system at very low extra cost, the idea being to have only one street lighting system harmonious throughout the city.

F. A. Vaughn, of Vaughn, Meyer & Sweet, Milwaukee, is engineer of street lighting survey for the city. The survey and the entire design of the new system were prepared by Mr. Vaughn and his engineering staff. F. G. Simmons is commissioner of public works, under whose general supervision the work has been done.

PRACTICAL STREET CONSTRUCTION---STREET CROSS-SECTION

Slope of Sidewalks and of Planting Strips—Relative Elevation of Gutters, Curbs, Planting Strips, Sidewalks and Yards—Terraces and Retaining Walls—Preservation of Shade Trees.

In exceptional cases the water flowing off of the sidewalk may be allowed to pass on to the lawns of private property, where it will be absorbed; but in the majority of cases it is desirable that all water falling outside of the property line be carried to the street gutters. This requires a cross-slope of sidewalks. As in the case of roadways, this slope should be as little as is necessary to carry all water with certainty to the gutter, since it is objectionable to traffic using the sidewalk. The smoother the sidewalk the less the slope which is necessary. New York some years ago established by ordinance a cross slope of 1 inch in 5 feet. Pittsburgh a slope of 1 inch in 4 feet for concrete and flag stone, and 1 inch in 2 feet for brick. One inch in 5 feet is probably about the flattest and one inch in 2 feet about the steepest which should be given to any sidewalk.

The amount of water flowing on the grassed or otherwise planted strips along either side of the paved portion is probably never sufficient to do any damage, and is therefore unobjectionable. For some incomprehensible reason many sidewalk builders construct, and cities

permit them to construct, the paved portion of the sidewalk as low as or even lower than the planting strips on either side of it, which results in the inability of the water to flow off of the paved strip, and turns each strip into a river or a lake, depending upon its longitudinal slope. There may be some excuse for keeping the planting strip which is on the inside of the walk on a level with the same, and permitting the water from such strip to flow across the walk to the other strip. But under no condition should the outer strip be higher than the paved portion, and it is very desirable that it be about a half-inch lower. Moreover, sidewalk paving is almost certain to settle more or less as the cinder foundation under it consolidates; while on the other hand, ground which is sodded tends to rise through the action of roots and frost and the gradual collection of dust and dirt held by the grass. The result is that, if a sidewalk pavement be laid originally at the same grade as the adjacent soil, a year or two will find the sod which has grown thereon stand higher than the pavement and thus prevent the draining of the latter. The pavement should

always be constructed at least an inch higher than unsodded soil and at least a half inch higher than soil carrying well developed sod; and it is better to increase each of these by a half-inch.

A sodded strip needs a greater cross-slope than a pavement for carrying off a given amount of water; but if the side adjacent to the pavement is kept $\frac{1}{2}$ inch to 1 inch lower than the pavement, slight temporary accumulation of water on the sodded strip will not be especially objectionable. There should, however, be some fall across the entire section of the sodded strip in order that no water may stand there permanently, and it is desirable to give the sodded strip an even greater fall than that required for a concrete or flag pavement. If a curb is provided, this would place the top of the curb lower than would be called for if the sidewalk pavement were extended out to the curb; or else the sod at the curb would be lower than the top of the latter. If the curb is of stone, it would probably be reset in any event when the entire sidewalk was paved, as it would probably have got more or less out of line or grade in the interval; and in resetting, it could be raised to agree with the new pavement. In the case of a low concrete curb, or of a stone curb which it is not desired to reset, the concrete sidewalk pavement, when extended to the curb, can be carried higher than the top of the curb to a point about one half way across said top, and there be finished with a bevelled edge; which construction is sometimes adopted solely to provide for expansion of the concrete sidewalk without overthrowing the curb.



Courtesy, Granite Paving Block Manufacturers' Association.
SIDEWALK ELEVATED ABOVE STONE CURB.
Springfield Avenue, Newark, N. J.

The purpose of the curb is to keep the water in the gutters from overflowing the sidewalk, to prevent vehicles from riding on the sidewalk, and to give a finished appearance to the street. Where the aim is to give a rural appearance to the street, the curb may be omitted and the outer sidewalk strip sloped down to the gutter, such slope being sodded, and the gutter being sodded also or else paved with cobble stone or other material. In this case the planting strip usually carries trees which sufficiently protect the sidewalk from the encroachment of vehicles.

SIDEWALK ELEVATIONS.

Whether or not a regular curb is provided, the elevation of sidewalk above gutter and roadway should be such that the sidewalk will not be flooded by any rains except unusual downpours. This will depend not only upon the intensity of rainfall in the section of the country under consideration, but also upon the slope of the gutter and the frequency with which the water flowing in the

gutters is withdrawn therefrom into sewers, streams or other channels. Where sewer inlets are numerous, a 4-inch curb has been found to meet requirements. With inlets at intervals not exceeding 500 feet and grades not flatter than 1%, a 6-inch curb is perhaps safer and is the more general practice. In at least one or two southern cities which are not provided with storm sewers and which have occasional heavy downpours, 10-inch and even 18-inch curbs are considered necessary and are provided. Aside from the cost of construction, the principal objection to these deep gutters is the difficulty of passing from sidewalk to roadway at street intersections.

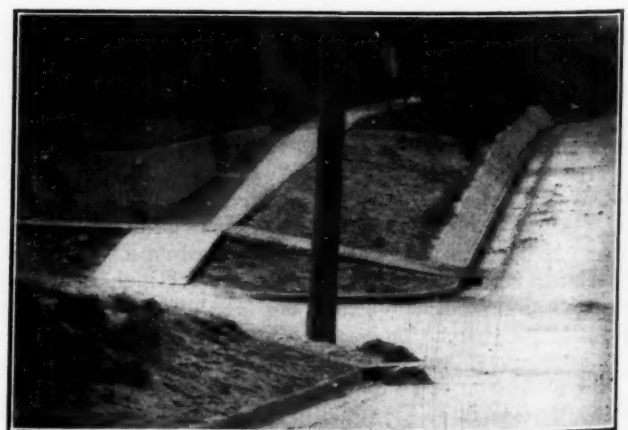


CURB DEPRESSED AT CROSSING.

In Houston, Texas, where such high curbs are found, the common practice is to place a step from sidewalk to roadway at each street crossing. In some cases, instead of a step, the sidewalk is sloped down to the roadway for about 5 feet back from the same at each crossing, the curb being depressed at such points.

Where there is considerable cross-slope to the street, especially in residential sections where the houses are set back from the street line, the yards and houses on one side of the street may of necessity be several feet higher than the roadway. Under such conditions there are in general two alternatives. One is to place the sidewalk 6 or 8 inches above the roadway, as would be called for by the principles just discussed; thus possibly leaving the house and yard at a considerable elevation above the sidewalk. The other alternative is to place the sidewalk more nearly on a level with the house (it is always desirable to have the house at least 2 or 3 feet higher than the sidewalk), thus placing the sidewalk several feet above the roadway. The latter plan is extremely elastic, however, and permits the placing of the sidewalk at any elevation greater than 6 or 8 inches above the roadway. It is generally much more economical in cost of grading than the former.

Whichever of these two plans is adopted, it becomes necessary to place either a terrace or retaining wall between the sidewalk and the yard level on one side or

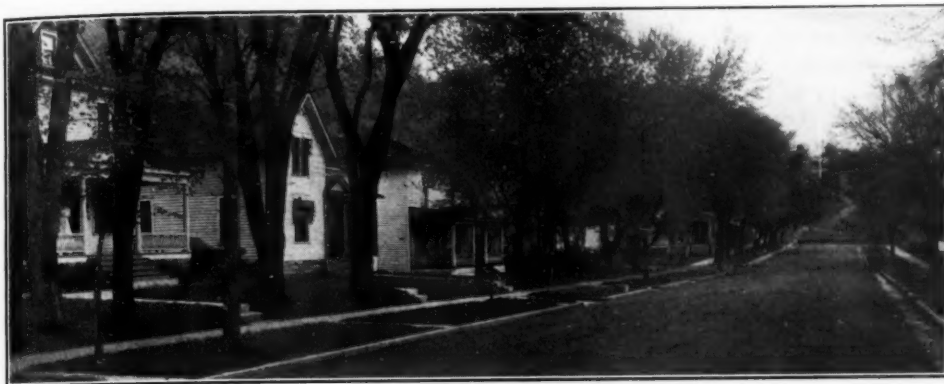


INCLINES FROM ELEVATED SIDEWALKS AT CROSSINGS.
Concreted slope as substitute for high curb. Prospect Street, Muskegon, Mich.



TERRACED PLANTING STRIP, WITH CURB.

In this case the two gutters were placed at the same elevation, and the original slope of the ground was met by placing the upper sidewalk at the original level, thus preserving the shade trees, and terracing down to the roadway level, providing a curb at the foot of the terrace. Apparently more width is allotted to the high sidewalk than to the lower one, to provide for this terrace. A private driveway up the terrace is seen in the mid-distance at the right. On the left is a driveway which causes a drop in the sidewalk pavement, which is next to the curb.



WASHINGTON STREET, EAU CLAIRE, WIS.

Washington St., Eau Claire, was laid out on level ground, in the foreground, but in the background the left curb gradually increases in height until it becomes a retaining wall about four feet high as it swings into the hill at the turn. The shade trees in the foreground are located on the further side of the sidewalk pavement, while in the background they are next to the curb. The appearance of the latter seems to us preferable, as it produces more of an arch effect. But if all were in either one position or the other it would greatly improve the appearance of the street.



Courtesy, Barber Asphalt Paving Co.

AVON STREET, FLINT, MICH.

In Avon street, Flint, the sidewalks are at about the same level, but the roadway is depressed about two feet, and a fairly wide terraced parkway and curb separate sidewalk pavement and roadway. Here the trees are on the roadway side of the sidewalk, but would better have been placed a little further from the sidewalk pavement. Placing the telegraph along the curb and the trees well back from the same, however, permits a minimum of interference of poles and wires with trees. When full grown, these trees will form a handsome arch across the street.



Courtesy, Ohio Quarries Co.

LANCASTER AVENUE, SYRACUSE, N. Y.

The treatment of a very steep and high bank is seen at the left of the view of Lancaster Avenue, Syracuse. Here the sidewalk was graded down practically to roadway level, with a long flight of steps leading to each house.

The view in Webster City shows how an elevated sidewalk is brought down to the level of the roadway crossing by an incline. On the next page the use of steps for this purpose is illustrated.



Courtesy, Barber Asphalt Paving Co.
ELEVATED SIDEWALK IN WEBSTER CITY, IA.

roadway on the other. A curb is in itself a small retaining wall, and where the sidewalk is placed some distance above the roadway, the curb may be merely carried higher. The retaining wall need not, of course, be carried to the full elevation of the land above it, but only to such point as will permit of a low terrace on a flat slope extending back from the top of the wall.

Perhaps the most common plan, because the cheapest, is to connect the sidewalk with the land above or roadway below by a terrace or slope which is sodded. In nine cases out of ten these slopes are made too steep, a great many of them being as steep as $1\frac{1}{4}$ or $1\frac{1}{2}$ to 1. It is exceedingly difficult to grow and maintain sod on a slope as steep as this, and the cutting of the lawn on such slopes is a difficult matter. It would be much better to make such slope at least as flat as 2 to 1, and 3 to 1 would be a better maximum to establish. Given such a maximum, a terrace of say 3 to 1 could be carried from the yard level to the line of the sidewalk (or 18 inches to 2 feet from the inner edge of the pavement, and the remaining drop be made by retaining wall.

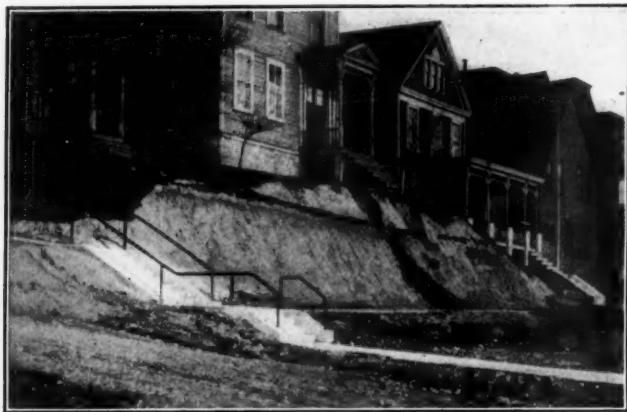
Where there are shade trees of any size, either between sidewalk and roadway or sidewalk and house, it is desirable to leave the ground surface around these trees at its original level, using either terrace or retaining wall

as may be necessary to accomplish this. This presence of shade trees may determine where the sidewalk should be placed in plan and whether a few inches or several feet above the roadway level.

Too many engineers and street planners set up a hard and fast rule that the sidewalk shall be just so many inches above the roadway, and have carried out such rule regardless of any existing conditions as to ground surface, trees or anything else. There are scores and hundreds of cases where raising a sidewalk several feet above the roadway would have saved much of the cost of grading, have preserved valuable shade trees and have given equally as good if not a better appearance to the street, all of which have been sacrificed to rigid and foolish adherence to an unnecessary standard.

ELIMINATING GYPSY MOTHS ON NEW BEDFORD'S WATER SHED.

During 1914, owing to the destruction by the gypsy moth of trees on the forest reservations on its water supply drainage areas, New Bedford, Mass., consulted State Forester F. W. Rane; and his recommendations were carried out in 1915, the Water Department cooperating with the state forester in carrying out cutting operations. These operations had the intention of removing most of the oak from the water shed and leaving and encouraging the pine, so that in the future no further trouble from the moths could be anticipated, and the land could be put into the best possible condition, both from the forestry and aesthetic standpoints, as well as from the standpoint of conserving the water supply in its purity. The operations were two fold. They consisted first in lumber and cordwood cutting, and second, in spraying, with modern apparatus which was purchased for the purpose, such oak and infested trees as were left uncut. To carry on the lumber operation, a camp was built in regular Maine woods manner, and a saw mill hired to put into lumber all the logs which were suitable. The remainder were chopped up into cordwood; about 600,000 feet of lumber were sawed up, much of which has already been sold to the railroads as ties and car stock, and the remainder is now drying in the lumber yard, and will soon be ready for sale. Over 3,000 cords of wood were cut and all of that is now either sold or under contract for sale at a price which will result in a small profit to the water works. The brush was all cleaned up and the land left in an orderly condition. It is already springing up to pine in many places, and in other places where it was possible to leave seed trees, it is confidently expected that pine will result. In a few places it will be necessary to plant.



The top cut shows steps used to descend from an elevated sidewalk to the roadway; also the effect of sidewalks at surface grade and approximately at roadway grade. The two lower cuts show retaining walls used where the sidewalk is placed much below the original surface level. Undercliff Avenue should have been made considerably wider, or the roadway narrowed, or both, so that the excessive height of the retaining wall could have been avoided, and a terrace substituted for part of it.

Courtesy, Warren Brothers Co.

UNDERCLIFF AVENUE, YONKERS, N. Y.

This year it is planned to continue the operation so as to complete practically the whole work. Not quite as much lumber or cordwood will be cut this year, but much of it is of better quality and so it is hoped that the operation will yield a larger profit to the city. This year's work is expected to clean up the entire area and solve the moth problem.

SEWER HOUSE CONNECTIONS*

Leaking Joints in These Responsible for Much Ground Water in Sewerage Systems—Method of Making Tighter Joints..

In a separate sewerage system it is intended that only the grossly offensive house sewage be received. No provision is made for roof drainage, surface drainage, and only a limited allowance for sub-soil drainage. It is found, however, that it is not an easy matter to keep underground water from entering the sewers through leaky joints. The amount of water entering the sewers in this manner is so great, as in some cases to make the sewage disposal plant inoperative for several days after each heavy rain storm. This is a serious matter where the sewage plant is located above some water supply used by a neighboring city or town. Attempts have been made to prevent ground water from entering the sewer system by constructing underdrains, and by improving the methods of making the joints. The underdrains are often jointed tile covered with broken stone, or gravel, and laid alongside and below, or directly beneath the main sewer. These drains receive the ground water, and discharge it into nearby water-courses, or storm water conduits, and thus prevent the ground water from rising above the main sewer and thus entering leaky joints. The method is only partly successful.

In order to make the joints in better manner various materials of a compact and water-proof character have been tried. These compounds include mixtures of sulphur and sand; mixtures of tar and oil, with other ingredients, making a water-proof joint material, such as Jointite and G. K. Compound. These and some other compounds are poured while hot, thus materially increasing the cost of making the joints. The use of these compounds has in many cases reduced to a minimum the infiltration of ground water in the main sewers, and tests made on sewer systems, just completed, where such materials are used for jointing often give surprisingly low figures as to leakage per mile of sewer. These tests have been made before the house connections were laid. In several instances it was noticed that as soon as the house connections were made, the amount of ground water entering the sewers after a rain storm increased at an alarming rate. This leakage, or infiltration, in some cases was so great that the pumps and disposal works provided were entirely inadequate to properly care for the flow of sewage. At one place, for instance, the sewage treatment works provided were designed to care for a maximum wet weather flow of 900,000 gallons per day. This figure included an allowance for probable ground water infiltration. Imagine, however, what the result must be when over 2,000,000 gallons of sewage and ground water is at times discharged at the disposal works. At another place the wet weather flow is so great that the sewage after heavy storms flows out of the top of the manholes. At still another place the sewage was backed up into cellars and flowed out of the manholes into the streets because the unexpected volume of sewage was more than the sewage pumps could take

care of. Investigations made at various places failed to show that any appreciable amount of this water came from roof leaders or surface drains secretly connected to the sewer system. In order to give some idea of the direct financial loss incurred by the admission of this ground water, the following instance is particularly mentioned:—At one plant situated on a small inland stream, where the sewage from a population of about 6,000 persons is treated, the wet weather conditions were so bad that it was considered advisable to institute some form of remedial measures in order to protect a large water supply, taken from the stream some distance below the town in question. The estimated cost of the necessary changes was \$35,000, or \$5.83 per person. This is a rather heavy tax.

The investigations mentioned above indicated that most of the leakage was due to the poor methods used in making the house connections. In one instance the contractor was found using clay for the jointing material on the house connection pipe line. In defense of the use of the material he stated that, "All the other connections in town were made in the same manner." The use of clay as a joint material was as early as 1878 discussed by a leading sanitary engineer, as follows: "The material most commonly used for jointing pipes is clay, which is one of the worst materials that could be found for the purpose." There is no reason for any change in this opinion expressed so long ago. It was also reported to the investigators that joints on the house connections had been made with mud. This on inspection proved to be a very weak mortar made with a dirty sand of poor quality. Instead of the clean sharp sand called for in the town ordinance, a dirty loamy sand had been used. Instead of a mortar consisting of one part cement and two parts sand, the mixture was about one part cement to six parts sand. It was found that in some cases, in removing the caps from the Y-branches, the latter had been broken and then had been patched in very crude ways, so that large quantities of ground water were admitted to the sewers. In one town the wet weather flow from leaky house connections was considerably reduced by requiring that in wet trenches the connections should be made with cast from pipe with lead joints. It may be thought that a few leaky joints, or a broken pipe on a house connection is not a serious matter, until a person realizes that the total length of the house connections is generally equal in length to the main sewer system, and in some cases even double the length of the main sewer. For example, if a main sewer has a connection every 25 feet, and each of these connections is 25 feet long from the main to the house, the total length of house connections is equal to the length of the sewer. Consequently, a few leaky joints on each sewer connection are in wet soils often capable of overloading the main sewer.

Some people believe that the admission of ground water into a sewer system is desirable. This belief is based upon the assumption that it is necessary to wash out the sewers, and provide a flow of water adequate to float the solid material. The benefits of this practice, however, are greatly overestimated, as a properly constructed sewer on a proper grade will cleanse itself, and if it is necessary to flush sewers laid on a low grade, it is better to rely on some means of flushing that can be readily controlled, such as the periodic flushing of the sewer with a fire hose, hand operated flushing manholes, or automatic flush tanks.

Apparently the advisable methods of preventing the infiltration of ground water into the sewer system by way of the house connections is to improve upon the methods of making the joints, and also to improve upon the methods of placing the caps in the Y-branches. For

*Slightly condensed from article in *The Cornell Civil Engineer*, by C. G. Wigley, Engineer, New Jersey State Board of Health.

the* latter purpose disks of galvanized iron have been used, but would appear to be of little value, due to the rusting out of this type of cap in unused branches. The ordinary terra cotta caps may be held in place with a gasket of oakum or jute, completely filling the space between the sides of the cap and the bell of the Y, and a thin rim of cement placed over the oakum to hold the cap in place.

As to the methods of laying the pipe, some of the patented jointing compounds would be of great advantage when used with care, and by using pipe 3 feet in length only two-thirds as many joints would have to be made.

In closing, it is desirable to indicate that there are certain sewer systems where the admission of certain portions of the ground water is permissible, but this privilege should only adhere to the combined system of sewerage, and even in this case the privilege should not be abused.

CONCRETE PAVING ON DUPONT ROAD

Nearly all Reinforced—Effect of Reinforcement—Effect of Various Quantities of Hydrated Lime—Details of Construction.

In a paper before the American Road Builders Association, Chas. E. Upham, chief engineer of the Coleman Dupont road of Delaware, described a number of conclusions arrived at from investigations made or features embodied in that work.

Before beginning construction a drainage survey was made of all ditches and streams for a half mile on each side of the road. Where black muck was encountered, which absorbed and retained large quantities of water, it was removed and replaced with more suitable material.

The sub-grade was rolled with a 6-ton roller. In some cases this appeared to break up the sub-grade instead of compacting it; but after the loose top was shoveled away it was found to be well compacted below.

Nearly the entire road is to be of reinforced concrete, but to test them in comparison, Amiesite, Hassamite and Warrenite also were laid.

In the concrete, mixed 1-2-4, were used various quantities of hydrated lime as an experiment. The lime was placed in the hopper with the other ingredients. The only conclusions that can be drawn yet are based upon the number of transverse cracks that have developed in the different slabs. On one section where no lime was used, the longest reinforced slab that has not developed a crack is 191 feet. When 10 per cent by volume of lime was used, the longest slab to develop no cracks was 210 feet. In another instance, a slab without reinforcement and using no lime has developed two cracks breaking the slab up into three slabs of 299, 118, and 128 feet. In two slabs where 10 per cent lime was used, no cracks have yet developed. The lengths of these slabs are 336 and 210 feet."

In another section the longest slab without lime which showed no cracks was 167 feet; the longest with 5% lime was 245 feet; with 10% lime, 294 feet. These figures do not furnish any definite conclusions, but apparently favor the use of lime. Five resident engineers and three inspectors who were asked their opinion of its use, each believed that the use of lime made the concrete more plastic, delayed the set, made it easier to draw the template, but made it more difficult to hand-float the surface, as it made the matrix stickier.

Each batch of concrete was mixed 1½ minutes and

it was concluded that it is hardly practicable or economical to require a longer mixture.

The sub-grade was wet before the concrete was deposited, and old and new batches were thoroughly spaded together to secure a homogeneous mass.

No uniform length of slab was adopted, but joints were placed only when the concrete mixer stopped for more than fifteen minutes. This resulted in some very long slabs, the longest being 460 feet. Transverse cracks have appeared in the longest slabs at regular intervals; and as sub-grade, materials and construction were especially good, it seems probable that these cracks were due almost entirely to contraction and followed a definite principle.

Nearly all the concrete pavement was reinforced, the reinforcement being placed 2 inches from the surface. This did not prevent transverse cracks entirely but probably reduced their number. (No longitudinal cracks have appeared.) One section is reinforced with No. 29 American Steel and Wire mesh reinforcement giving 2.52 pounds per square yard of pavement. Another is reinforced with No. 25 Khan expanded metal giving 2.25 pounds per square yard. A third section was reinforced with the same metal for a distance of 4 feet each side of the center line. More cracks have appeared in this last section than in the other two where the reinforcement extended the entire width of the pavement. Another section was reinforced with the same reinforcement for 3 feet each side of the center line, resulting in a still greater number of cracks. With one exception, as the percentage of reinforcement increased the transverse cracks became fewer. The increased cost due to reinforcement was 9 cents per square yard; which sum, if put into concrete, would add but ½ inch thickness to the road.

The templates used to finish the concrete surface were made from 4 x 4 x ½ inch angle iron bent to conform to the crown of the road. These worked satisfactorily after the laborers learned how to use them. Where possible, the template was not drawn over the pavement more than once, with the idea of disturbing the concrete as little as possible; after which the surface was finished with wood or cork hand floats. This precaution resulted in the stone aggregate remaining very near the surface; or, in other words, there was very little mortar above the wearing stone.

Immediately after the concrete was finished, wooden frames covered with canvas were placed over the concrete to protect it from the sun and wind, and were kept there for about 24 hours; after which the concrete was covered with 2 inches of earth and kept wet for 14 days. After 30 days this covering was removed and the concrete allowed to harden two weeks more before traffic was allowed on it.

Although there was much sand in the vicinity of the road, it was decided after testing a great deal of it, that none was suitable for concrete work, and the sand used was dredged river sand obtained about 90 miles away and brought by rail. Samples of each car load of sand were taken when it was started, and the tests were completed by the time the cars had reached the work. Crushed trap rock was used for coarse aggregate, run-of-crusher passing a 1½-inch ring and being retained on a ¾-inch. The testing engineer made sieve analyses of stone and void tests of sand three times a week, making slight changes in the proportions of the ingredients if these analyses indicated this to be desirable. A few tests of cubes showed that, when using the same ingredients, mixing 1½ minutes gave 13% more compressive strength than ½ minute mixing.

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MAY 18, 1916

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Leakage in Sewers.

It may be said, as a general statement subject to occasional exceptions, that every sewer, water main and gas main leaks more or less. It is also true that any main or sewer can be made so tight that the leakage through it can not be measured with ordinary physical appliances. But complete tightness costs money in shape of materials and time of skilled labor. The question is: beyond what point does it cease to pay to secure additional tightness?

In the case of sewers, excessive leakage of water from a sewer may so reduce the depth of the transporting liquid as to leave the suspended solids stranded in the sewer. Or the sewage may find its way from the leaking sewer into wells or cellars; or it may escape by a sub-drain which discharges into a stream which should not be polluted. It is believed, however, that where the escape is through the soil rather than through a sub-drain, the soil in time becomes clogged around the leaking joints, which prevents further leakage; except in those cases where the sewage follows the outside of the sewer until it reaches an outlet.

The difficulty which most impresses itself upon the sewerage official, however, is the ground water which enters the sewer through the leaking joints. This is an advantage in that it lowers the ground water level in the city; but it is sometimes so abundant as to occupy fully half the capacity of the sewer. This may cause little concern at first, but as the amount of sewage approaches the capacity of the sewer it becomes a very serious matter.

Almost as serious, and sometimes more so, is the flooding of purification plants during wet weather, when the seepage is greatest. A purification plant can be enlarged much more easily than a sewerage system can; but the failure to enlarge it may result in a serious pollution of the river and possibly fatal consequences to cities below. Such pollution must be prevented at any cost; and this cost—that of enlarging the plant—is a definite measure of one element of the value of securing tight joints in the sewer. Given a known cost of treatment (capital and operating expenses) per thousand gallons, and the cost—that of enlarging the plant—is a definite measure of leakage (as the joints are made tighter, each successive thousand gallons saved costs more than the thousand before), and we can determine at what point it would be cheaper to purify the next thousand gallons of seepage than to prevent it.

The capacity of the sewer system, also, must be increased to accommodate the seepage, and a reduction in seepage may be found to be economical by reason of this saving in cost of sewer construction. Of these three costs—reducing seepage, treating sewage, and enlarging sewer capacity—the first presents the most difficulty of calculation; but data are accumulating which can be used for this purpose, and will permit solving this problem from the purely financial standpoint.

Another point should be stated most emphatically—that a large part of the seepage existing in many sewer systems is preventable at no cost except that of careful supervision of the work. As suggested by Mr. Wigley (on page 689 of this issue), much of this seepage may be into the house connections, and eternal vigilance in oversight of the construction of these, year in and year out, is necessary for keeping down the ground water seepage, except in sections where there is no ground water. A system of sewer mains may have perfectly tight joints, obtained perhaps by use of special jointing compounds; but the mileage of house connections may easily be even greater than that of the sewers, and failure to make these tight may nullify all expense and care employed in the sewer construction.

Planning for Street Lighting.

The example of Milwaukee in studying systematically and scientifically the problem of lighting its streets is one which other cities could follow to their advantage. The plan of adopting a certain lamp of some given candle-power because it looks well in some other city, and placing the lights where merchants or residents want them and at the request of the councilman from the ward in question, can not be expected to produce a maximum of illuminating effectiveness at a minimum of cost. Each street can best be served by some one kind, intensity, height and spacing of lights; and these will vary with width of street between buildings and between shade tree lines; kind of shade trees (as determining height of their lowest branches); nature of traffic on street and purpose for which the buildings thereon are used; and other conditions. Failure to recognize this fact and to plan intelligently the lighting of each street will result in unnecessary expense or defective illumination—probably both.

Street lighting, like sewerage or water supply, is a public service for the benefit of the whole people. It is a system and not a mere collection of unrelated units. And it is a matter which requires expert knowledge if effectiveness and efficiency are to be secured. And real economy will generally consist in securing such expert knowledge at the outset for the initial planning of the system.

The WEEK'S NEWS

The Federal Good Roads Plan—Commission to Investigate New Jersey's Roads—Sewage Disposal Plans for Detroit—Proposed Water Supply for Dallas—Company Against Dallas Bond Issue—Chief Shrewsbury Killed—Salt Lake's Ousted Police Chief—Denver Gives Up Commission Government—Detroit's Garbage Plant Burned—Providence City Workmen Strike—City Planning in Santa Monica and Johnstown.

ROADS AND PAVEMENTS

Senate Passes Roads Bill.

Washington, D. C.—The senate has passed the Bankhead good roads bill to spend \$85,000,000 in construction of post-roads, contingent on an equal expenditure by the states. Appropriation for \$10,000,000 for roads in national forests is included. It differs from the house bill. A fight led by Senator Smoot, of Utah, to extend the credit of the United States to the states for construction of roads by them was lost, 47 to 20. The bill appropriates \$5,000,000 for the year ending June 30, 1917, with increasing appropriations until 1921, when the entire amount is to have been spent. The money is to be apportioned by the secretary of agriculture, according to the terms of the bill, on a basis of one-third in the ratio of the state's area to the total area of the country, one-third in the ratio of the population, and one-third in the ratio which the mileage of rural delivery routes bears to the total mileage in the country. Senator Lippitt, of Rhode Island, introduced a table showing that three eastern states, New York, Massachusetts and Pennsylvania, would contribute through their taxes more than one-half of the entire revenue appropriated for roads.

Board to Investigate Roads.

Trenton, N. J.—Attributing past failures to bring about a satisfactory solution of road problems in the state to political juggling, Governor Fielder has announced the appointment of a committee of five members to make an independent investigation of the subject. The appointees are: State road commissioner Edwin A. Stevens; J. H. Wood, chairman of the committee on legislation of the Associated Automobile Clubs of New Jersey; John W. Herbert, a member of the State Chamber of Commerce; Frank B. Ridgeway, farmer and member of the State Grange; Horace A. Bonnell, a dealer in automobiles and chairman of the committee on good roads of the Associated Automobile Clubs of New Jersey. In announcing the appointments Governor Fielder said he fully realized the magnitude of the work and the sacrifices involved in compliance with his request. He added that the new committee "is to investigate the road needs of the state, our present laws and wherein they are deficient and to make a report to me which I can submit to the next Legislature as a basis for action. Perhaps an entire revision of our road laws is necessary."

State Aid to Georgia Counties.

Atlanta, Ga.—The various counties of Georgia will get this year \$90,387.15 from the state road fund, derived from the sale of 1916 automobile license tags, which fund is to be prorated among the several counties and to be expended by them upon road construction. Secretary of State Phil Cook stated that this sum will be disbursed as soon as the counties have furnished him with the statement of their respective road mileage, as required by the new automobile tax law. The law requires that the fund be prorated among the several counties according to the public road mileage in each county and outside the corporate limits of towns and cities. This information is to be furnished the secretary of state by the commissioners of each county, and each county's eligibility to share in the state road fund is predicated upon 90 per cent of the motor vehicles in the county having been registered. In addition to the road mileage, Secretary Cook is collecting data as to the number of cars returned for taxation in each county and the amount

of money expended on public roads last year. The figures in the office of the secretary of state show that the total number registered for 1916 up to May 1 was 33,706. This number, it is anticipated, will increase to 40,000 before the end of the year. The total gross receipts from the sale of automobile and motorcycle license tags, chauffeur's license and similar sources under the new automobile tax law, up to May 1, amounted to \$118,821.50. The law requires that \$1 from the sale of each tag and the fees from all chauffeurs' licenses, transfers and duplicates of registrations be set aside as a reserve fund, to be deposited with the state treasurer as a part of the general treasury fund. This reserve fund amounts to \$37,606.63. The total operating expenses of the law have amounted to \$7,267.44. The figures deducted from the gross total leave a road fund of \$73,947.43. This sum has been deposited with the state treasurer, and to it must be added \$16,439.72, which was received from the sale of automobile license tags in 1915 after the disbursement of the road fund for 1915, which makes a total road fund available now of \$90,387.15. The operating expenses of the department amounted to but six per cent of the gross receipts and the cost per license amounted to 21 per cent. The fact that the new law provides for a graduated scale of license taxes, instead of the former flat rate of \$5 per license tag, materially cuts down the state's revenue from this source. Under the old law Georgia would already have received this year more than \$165,000 from the sale of license tags, and by the end of the year would receive upwards of \$200,000.

SEWERAGE AND SANITATION

Proposes Big Plant for Detroit Sewage Treatment.

Detroit, Mich.—George Fenkell, commissioner of public works, has transmitted to the common council the preliminary report of Clarence Hubbel, consulting engineer, who was engaged by Detroit to protect its interests in the investigation of boundary waters pollution conducted by the international joint commission, composed of representatives of Canada and the United States. The report recommends the construction of a sewage purification plant, including works in the west side of the city and others at Fairview, to be erected at a cost of \$6,091,000. A system at this price would purify the sewage of Detroit until the city's population reached 950,000, the report states. The operating cost would be \$517,430 a year, or 54½ cents per capita, it is estimated. Mr. Hubbel reviewed the data and conclusions the International Joint commission reached after hearings on boundary waters pollution held in Detroit and practically every other lake port city in 1914. "From a study of the joint commission's findings, it seems that pollution may, and at times undoubtedly does, cross the boundary line from either the United States or Canada in such a way as to render the waters unsafe for domestic uses without treatment or purification," says the Hubbel report. "The pollution crossing the boundary line from either side has not reached such a degree as to render the waters on the other side unfit as a source of raw water supply for a purification plant." The engineer declares that the purification of all sewage going into the Detroit river would not render the water safe for drinking purposes, because of the amount of unpreventable pollution that reaches the river from surface drainings, street wash and other incidental sources. Preventive measures to stop pollution crossing the boundary line between the United States and Canada should, he

says, be limited to the treatment of sewage to the extent where its purification would not place an undue burden on any water purification plant. The report says that such results can best be insured by sterilization of sewage discharged from vessels and by eventually collecting all urban sanitary sewage at convenient points where it may be treated. The pollution in Detroit river hugs the shore line with a remarkable persistence, the engineer said. Along the American shore, a zone of grossly polluted water extends the entire length of Detroit river from Lake St. Clair to Lake Erie. The pollution is greatest toward the shore and decreases rapidly toward the center of the river. The width of this polluted zone varies with the seasons and weather conditions. Opposite Detroit, from Belle Isle to Fighting island, it occupies one-third of the river. The pollution extends into Lake Erie for 20 miles in gradually decreasing intensity. "The public water supplies most affected," says the report, "are those at Ford, Wyandotte, Trenton and Monroe. Ford and Wyandotte can obtain water suitable for filtration by extending an intake about 3,000 feet into the river. Trenton cannot now obtain a suitable supply for a reasonable cost, but could do so were Detroit's sewage treated as recommended." The treatment suggested is that of sedimentation combined with disinfection.

Measles in Pennsylvania Cities.

Lancaster, Pa.—Fifty-seven schoolrooms were closed in the campaign to eradicate measles in the city. In one week 210 new cases were reported, making a total of 700 cases. The closing order affected half the elementary schools of the city. Theatres, moving picture shows and Sunday schools were barred to children under ten.

Harrisburg, Pa.—Harrisburg had over 2,200 cases of measles reported between April 1 and May 5. The city's population is about 70,000.

City May Stop Insanitary Cars.

Olympia, Wash.—A city of the first class may prevent the operation of street cars in a condition calculated to injuriously affect the health, safety or welfare of the inhabitants of that city, according to an opinion written by the attorney general. "If it can be established as a fact that a poorly ventilated car, or a car not cleaned as provided in the city ordinance, is a nuisance or is detrimental to the general health of the community, as distinguished from the convenience of the passengers, the city may properly prevent the use of such a car within the city limits," states the opinion. It was written to the public service commission as the result of an inquiry from the health department of Spokane.

Smallpox and Politics in Wilmington.

Wilmington, Del.—The new board of health has lifted the quarantine on schools, saloons, churches and other places and the city is again in normal condition. Opinions are widely expressed that the prevalence of smallpox was more of a scare than an epidemic and that politics played a large part in the over-strict quarantine, widespread vaccination and closing of public places. The saloons were allowed to open a number of days before permission was granted to the churches. There were a total of thirty cases under surveillance, and some of these are thought to have been chickenpox and "black measles" rather than smallpox.

To Investigate Bottled Waters.

Springfield, Ill.—The state board of health has announced its intention of investigating and examining vended waters with a view to safeguarding the public against the dangers which are suspected to lurk in some bottled waters now being supplied. The statement says: "The recent epidemic of typhoid fever in Moline calls forcible attention to the danger lurking in the use of bottled waters not subjected to inspection. The general public is in the habit of placing blind faith in the sanitary quality of waters sold in bottles. As soon as practicable the present status of vended water in Illinois will be canvassed by the new engineering bureau

of the state board of health, not with a view of antagonizing the business, but with a view to securing the co-operation of persons and companies engaged in selling bottled water, to the end that the well-conducted establishments may be certified by the state board of health as offering for sale a product that meets proper sanitary demands."

Sewerage System But No Waterworks.

De Funiak Springs, Fla.—The citizens have voted in favor of bonds for a sewerage system, but defeated an issue for a water system. So far the city officials have not developed any plan for putting into practice the will of the people.

WATER SUPPLY

Protection of Water Supply System.

Philadelphia, Pa.—In the future the business section as well as some of the more thickly populated parts of the city are to be better protected against damage resulting from breaks or leaks in water mains or pipes. This protection is to be afforded as the result of a reorganization of the purvey districts of the water bureau, which is now being worked out by Carleton Davis, chief of the bureau. A purvey district is a sort of substation of the water bureau, where squads of men are on duty prepared to respond promptly to any call issued as the result of a breaking of a water main or pipe, and quickly make whatever repairs may be necessary. The improvement in the business section will be brought about by the establishment of a new purvey district, more quickly accessible to the four most important streets in the business district when a leak may mean the loss of thousands every minute. It is the intention of Chief Davis to change the headquarters of the purvey district which includes the northeastern section of the city and to take similar action regarding the district which includes West Philadelphia.

Water Plant Successful.

Oshkosh, Wis.—That municipal ownership of the water works system here was a profitable move by the city is shown by a report of the city water department. The net earnings of the water system for the last nine months were \$19,412.28. Adding this to \$19,902.59 previously earned gives the city a total surplus to date of \$39,314.87, which will be applied to the fund for erecting the filtration plant, now in course of construction, and which will cost about \$150,000.

Report on Dallas Water Supply.

Dallas, Tex.—That a filtration plant should be erected by the city of Dallas to purify water from the White Rock reservoir or steps taken to provide a better source of supply for the city's water is the recommendation of V. M. Ehlers, state sanitary engineer. Mr. Ehlers, with Dr. W. B. Collins, state health officer, and Dallas officials, recently made an inspection of the reservoir and its watershed. Mr. Ehlers' report unqualifiedly characterizes the present condition of the reservoir and its watershed as one likely to lead to disease. Sanitary conditions on the watershed are described as very bad. He recommends immediate provision of means to disinfect water used from the reservoir and investigation of the feasibility of another filtration plant. It criticises the location of the intake pipe for the pumping station. The report states that the capacities of the city's reservoirs have a total of 1,414,000,000 gallons. Assuming a dry year and a daily consumption of 20,000,000 gallons this would be a storage of seventy days, while but a few years ago it was shown that a storage of more than nine months would have been desirable. It is, therefore, evident that with the limited storage capacities on Elm Fork the White Rock reservoir, with its unfiltered water, would have to be used as a reserve in a period of drouth, which might follow several dry years and at the time when the water at White Rock is at its lowest stages. Unless some provision is made for the construction of a filtration plant

(which should be of the same capacity as the main supply) this supply would be quite unsafe. The White Rock watershed comprises over 100 sections of land and is inhabited by approximately 5,000 people. A large percentage of these are renters, who can not be expected to keep their premises in a sanitary condition, maintaining dry closets. On the watershed several dairies, a large number of horses, mules and swine are found. Cemeteries are provided for the various communities, some of which are in close proximity to the reservoir itself. The privately owned tracts of land near the reservoir are used for pastures. Cattle and hogs are known to bog in the streams and to perish and decay. Three railways and twelve county highways cross the watershed. Town lot additions, pleasure parks and camp meeting grounds, where large numbers of people congregate, are located in the proximity of streams draining into the reservoir. No provision has been made for the proper disposal of night soil—the old types of dry closets are very much in evidence and only two septic tanks were found in use. While the drainage from some of the closets may not reach the waterworks intake, considerable numbers of them are in the immediate vicinity of the intake. It is reported that some water from White Rock is used every day during the summer months and a breakdown or flood damage may put the filtration plant out of commission at any time. The report therefore recommends that provision be made for the efficient disinfection of all water from White Rock reservoir; that the faulty construction of the intake pipe be remedied as far as possible; and that all possible effort be made to prevent the present pollution now taking place, following a sanitary survey and health campaign in the watershed region.

STREET LIGHTING AND POWER

Company Contests Municipal Plant Bonds.

Dallas, Tex.—Stone & Webster will contest the validity of the \$500,000 electric light plant bond issue, which was carried on the face of the returns by sixty-seven votes in the city election April 4. Notice of the contest has been filed with Mayor Henry D. Lindsley by Edward T. Moore, general manager, and R. C. Brooks, general superintendent of the Dallas Electric Light and Power Company. There are five allegations in the notice, the principal contention being that persons who were not qualified were allowed to vote. Although it is a distinct notice of contest, in one respect the allegations are similar to those filed by private citizens some time ago in which the charter amendment vote was attacked on the grounds that votes were cast and counted after 7 o'clock, the closing hour for the polls. The company also claims that the ordinance calling the election was irregularly adopted and that not enough time was allowed as required by law.

Commission Inventory of Jersey Utilities.

Trenton, N. J.—Following a conference at Newark between L. D. Howard Gilmour, of counsel for the Public Service Corporation, and corporation engineers and engineers of the state board of public utility commissioners, it was announced that commission investigators would pursue to completion their own inventory of underground conduits, manholes and meters of the Public Service Electric Company, into whose rates an inquiry is being made. Pushing along the commission work separately from the company's own inventory, endeavors will result, it is expected, in getting ready about September 1 so that an agreement on figures between the commission and the company may be possible before October 1. The conference was called in the expectation that the company might arrange its own inventory activities so as to submit conclusions on certain properties to the commission's engineers before summer. Difficulties, however, made it advisable to agree to work separately until about September 1, when all material is to be ready, with the exception possibly of figures on cable values. The utility commission has presented through experts practically all the testimony it will

give on real estate of the company. Each piece of real estate was valued by two experts for the commission, and the company will submit its own estimates wherever there is any striking difference in method of valuation or in results.

Organization Tax Trust Must Be Returned.

Louisville, Ky.—The Louisville Gas & Electric Company won its appeal from the Franklin Circuit Court for its suit against former State Auditor Bosworth to compel restitution of the organization tax of one-tenth of 1 per cent on \$7,850,000 of its capital stock paid under protest. The company tendered tax on \$2,150,000, the amount of its capital in excess of that of the Louisville Gas, Kentucky Heating and Louisville Lighting Companies merged into it, but the Secretary of State refused to accept its articles of incorporation until the tax was paid on its \$10,000,000 capital. The Franklin Circuit Court decided against the company, but the Court of Appeals at Frankfort held that it is required to pay only on \$2,150,000.

Electric Power Survey.

Dunkirk, N. Y.—Roy Husselman, an electrical engineer representing F. W. Ballard of Cleveland, who has been engaged by the water commissioners to make an electric-power survey of the city, has arrived here and has started the preliminary work. W. Johnson, another engineer associated with Mr. Ballard's staff, is also in the city. Mr. Johnson is a specialist in power steel plants and similar industrial uses. Mr. Ballard will arrive here shortly to take personal charge of the survey. From the results of the survey the water board will determine whether it is best for the city to install new machinery at the municipal power plant, or take power from the Niagara & Erie Power company and have the city act as distributor, or to have the city grant the power company a restricted franchise.

FIRE AND POLICE

Fire Chief Killed in Auto Wreck.

Long Beach, Cal.—Joseph E. Shrewsbury, chief of the fire department, was fatally injured and three others were hurt when the fire chief's automobile collided with a motor chemical truck during a fire run. Shrewsbury died soon after reaching a hospital. Clarence Craw, assistant fire chief, was the most seriously hurt of the three injured. It was believed his skull was fractured. Clark Shaw, riding in the fire chief's machine, and George Wright, chauffeur of the chemical truck, were thrown to the street and rendered unconscious for a long time. Chief Shrewsbury held his position in the department for twenty years. He organized the department. He was 49 years old. As past president of the Pacific Coast Fire Chiefs he was well known over the coast. All city offices were closed in his honor during his funeral.

Police Chief Ousted by Supreme Court.

Salt Lake City, Utah.—C. W. Shores of Denver was ousted as chief of police of Salt Lake when the supreme court of Utah held that he was not a qualified elector of the state or of the city at the time of his appointment and therefore ineligible to hold the office. Under the decision of the supreme court Mr. Shores is barred absolutely from any form of service with the Salt Lake police department, even that of patrolman, on the ground of ineligibility, as the court's decision says: "It is adjudged that the defendant be ousted and altogether excluded therefrom" (police department). Inspector A. J. Mullings was designated by Mayor Ferry to take charge of the police department. Mayor Ferry did not appoint him acting chief, but permitted him to take over the department as the ranking officer on the police force. Mr. Shores was appointed chief of police by Mayor Ferry on January 17, 1916, and was confirmed by the city commission. On April 13, W. H. Korn, acting on the relation of the state of Utah, filed quo warranto proceedings in the supreme court to

oust Mr. Shores from his office on the ground that he was not eligible to the appointment. H. J. Dininny, city attorney, and W. H. Folland, assistant city attorney, represented Mr. Shores. The case turns on two points, one of which is: That since the year 1888 the legislature has jealously safeguarded the doctrine of local self-government, which has become crystallized in the provisions of section 221 of the compiled laws of 1907, which says that "no one shall be eligible to any (city) office who is not a qualified elector of said city." The other point was in answer to the contention of counsel for Mr. Shores to the effect that section 221 had been impliedly repealed by the enactment of 1899, creating a police department, by the terms of which the city council was given the right to define and prescribe the "qualifications" of the members of the department. It was contended that as to the police department, section 221 was repealed by implication, since the city council, which had the right to "prescribe qualifications," had not required that the members of the police department should be "qualified electors." It was shown, however, that between the terms "eligible," referred to in section 221, and "qualifications" referred to in the act of 1899, there was a clear distinction, the former meaning capable in the first instance of being appointed, and denoting a condition existing at the time of appointment, the latter referring to mental and moral endowments and natural fitness to discharge the duties of the office after a legal appointment had been made.

Lightning Starts Big Blaze.

Chicago, Ill.—Lightning is blamed for a spectacular fire which completely gutted a five-story building occupied by the American Wall Paper Company and nearly caused the deaths of fire marshal Thomas O'Connor, assistant fire chief Patrick Donahue and members of engine companies 3 and 14. Damage was estimated at between \$75,000 and \$100,000. Volumes of smoke for a time enshrouded the north end of the loop, and for several minutes trains on the elevated tracks were held up. Surface car traffic on the street in which the fire occurred was not resumed for some hours later. Following a stroke of the electric storm the flames spread throughout the structure, one of the oldest buildings in the loop, with such great rapidity that three alarms were sent in. An explosion wrecked the windows of the upper floors, and two members of truck company No. 9, who were playing the hose from an extension ladder, were cut by flying glass. The lives of Marshal O'Connor and Chief Patrick Donahue were endangered when an iron door crashed from its hinges from an upper floor into the rear alley ten feet from where they were standing. When the flames reached the fourth and fifth floors, where quantities of paint, varnish and chemicals were stored, the firemen lost control and centered their energy in attempting to save the five-story structures on each side. Streams of water, pumped from nearly a score of engines and the fire tug, were thrown into the burning buildings.

Ferry Apparatus to Dock Fire.

South Jacksonville, Fla.—Entailing a property loss of more than \$100,000, fire of unknown origin destroyed the dock and warehouse shed located on the south side of the St. Johns river. At least four barges, heavily laden with merchandise, were also destroyed. The dock and warehouse shed, stretching 350 feet from the shore line toward the river channel, about sixty feet in width, were burned to the water's edge. Four large lighters of the Clyde Steamship Company, heavily loaded with merchandise of all descriptions, were tied up at the dock when the fire started. Two of them, wrapped in flames, were set adrift in the river, and the other two suffered the fate of the dock and warehouse. The fire was first discovered burning in the southern end of the terminals. At the time a strong breeze was blowing and within a few minutes the entire structure was burning fiercely. A fire alarm was sounded, and the volunteer company of South Jacksonville, in charge of Chief Hanner, responded. However, it was soon evident that the department, which worked energetically with the means at hand, had little chance to cope successfully with the blaze, and Fire Chief Thomas W. Haney of Jacksonville was ap-

pealed to for aid. Chief Haney rapidly assembled available equipment from three local stations and took the wagons across the river on the ferryboat and joined in the fight. Even then it was impossible to check the fire, and every effort was exerted to prevent the spread of the fire to other property. In the meantime two of the loaded lighters had been set adrift, and threatened to endanger docks further east on the river, as well as a big fertilizer plant. A tugboat rendered valuable assistance in running down these blazing lighters and deluging them with water from hose with which the boat is equipped. The fire, illuminating the river for miles, was a spectacular one, and attracted thousands of people to the water front on both shores of the river.

Big Lumber Mill Fire on Busy Day.

Duluth, Minn.—On a day of fifteen alarms scattered over the city the Duluth fire department was put to a severe test, particularly in a \$300,000 lumber mill fire which swept the river front. The big fire started in an abandoned shack and is said to have been caused by boys playing with matches. Fanned by a strong gale the flames spread to nearby houses and then threatened the Interstate railroad bridge and the Alger-Smith lumber mill. For hours the whole department, excepting companies in outlying sections, aided by two Superior, Wis., companies, fire tugs and volunteer bucket brigades, fought desperately to save the \$250,000 mill of the Alger-Smith company, and finally succeeded in cutting off the path of the flames so that they burned directly toward the bay, taking with them the entire northeast section of the yard. Extending beyond railroad approaches to the interstate bridge was a seething mass of flames. Blinded by cinders, dust and smoke, and handicapped because of the lack of hose, firemen fought against great odds. A wall of water was poured along the bridge approach and covering the mill building, but it was several hours before the structure was out of danger. More than 20,000,000 feet of lumber were destroyed in the yards.

Police Resign When Patrol is Taken.

Alpena, Mich.—Alpena is working with a two-man police force following the resigning from the service of chief of police Clifford, sergeant Patrick Henry and patrolmen Fred Miller, Charles Musgrave and Elmer Malcomson, because the police patrol auto recently placed in the fire department by city manager Roby was not returned to the police department. The chief and his assistants in a communication to the city manager, asked for the return of the patrol automobile, stating that unless it was returned, they would retire. City manager Roby asked for their resignations.

GOVERNMENT AND FINANCE

Denver Abandons Commission Government.

Denver, Colo.—At a special election this city returned to the mayoral form of government after less than two years under the commission form. Robert W. Speer, former mayor, was re-elected to that office by a majority of 3,000 votes. The election was invoked by the circulation of a petition by the Charter League, which urged a return to the mayoral form of government, but did not designate a candidate.

Manager Plan Defeated.

Baker, Ore.—Baker will retain the commission form of government. A proposition to put municipal affairs into the hands of a city manager was defeated by a vote of 809 to 369. An increase in the salaries of the present commissioners was voted by a majority of 149 votes. The salary of the mayor, C. L. Palmer, is raised to \$2,000 a year, and those of commissioners Henry and Whittier to \$1,800.

No Managers for Pennsylvania Boroughs.

Vandergrift, Pa.—Vandergrift will not have a borough manager any longer as the result of an opinion handed down by Judge A. D. McConnell at Greensburg, in the case of Walter Chapman and a committee of citizens who brought an action to have the ordinance creating a manager for the borough set aside. The court finds that the council has no right to delegate the managerial powers to a single in-

dividual or to employ a man for such a position. L. G. Anderson was employed at a salary of \$1,800 a year. Other boroughs in the state have employed managers and this is the first test case.

STREET CLEANING AND REFUSE DISPOSAL

White Wings on Strike.

Chicago, Ill.—Strike conditions in the tailoring, metal trades and other industries spread to the city's street cleaners and 426 white wings left their brooms. Most of the men are foreigners, holding employment, it is said, by favor of politicians. The ward leaders threatened to displace them with negroes on the eligible list.

City Crematory Becoming Profitable.

Topeka, Kans.—The city garbage disposal plant burned 440,374 pounds of garbage and trash during the past month, according to figures issued by Cecil Forter, superintendent of the plant. Besides the garbage disposed of at the plant city teams hauled and dumped 174 loads of garbage which were collected about the city. The receipts from the disposal of garbage have jumped from \$79.90 during the month of February to \$440 in April, showing, according to Superintendent Forter, that Topeka citizens are beginning to patronize their own disposal plant. "It will not be long," said Forter, "until the plant will become self sustaining. We have the plant and the facilities to do all the work Topeka can give us."

Garbage Plant Destroyed by Fire.

Detroit, Mich.—The entire plant of the Detroit Reduction company at French Landing, near Belleville, which cares for all the garbage from the city of Detroit, has been destroyed by fire. The loss was estimated at \$75,000. A huge digester in which the garbage is cooked, and several tanks of naphtha exploded, wrecking what the flames did not consume. Most of the 60 workmen fought the flames and were endangered by the explosions, but fortunately escaped. The company has been working on three new buildings just across the Huron river from the old plant. These escaped injury. Two of them are almost completed. General Manager Fred Cumings rushed work so that operations could be started in them without delay and several digestors were constructed in the open, as was done when the plant burned some years ago. The origin of the fire was undetermined. It started near the boilers. All parts of the structure are well covered with a thick coating of grease and the flames spread so rapidly that the workmen had to hurry for safety. Six freight cars loaded with garbage were destroyed.

RAPID TRANSIT

Schenectady Car Strike Arbitration.

Schenectady, N. Y.—Following a complete tie-up of car traffic lasting over 35 hours, both sides finally agreed to arbitration and the car men returned to work. After many conferences between officials of the company and the union, the city officials and members of the state board of arbitration, the questions to be arbitrated upon were decided. Much of the credit for the agreement is due to the untiring efforts of Mayor George R. Lunn. Only the questions of wages and length of agreement are to be submitted to arbitration—to a board of three, consisting of representatives of each side and a third chosen by the two.

Jitney Ordinance Found Reasonable.

Kalamazoo, Mich.—Jitneys operating on Kalamazoo streets are declared subject to reasonable regulation by the city in the opinion handed down by Judge Weimer of the circuit court, and the owners must now comply with the provisions of the ordinance adopted by the voters at the April election. Attorneys for the owners will immediately appeal the case to the supreme court and endeavor

to secure a writ preventing the city from enforcing the ordinance. The court held that the owners could have no fixed rights, established or vested, in the use of the streets, as common carriers, which were not subject to regulation and control by the authorities. It is explained that the study of conditions did not show that the plaintiffs would suffer irreparable injury as a result of the enforcement of the ordinance. "The jitney business in this country is of comparatively recent origin and rapid growth. The identical objections made to the provisions of this ordinance have been made in other states. The great weight of authority is decidedly against the plaintiffs in so far as they claim that the ordinance is unreasonable and discriminatory," the opinion reads. Now that the injunction of the owners has been set aside, it will be necessary for them to take out licenses and file bonds with the city treasurer in order to continue in the business under the terms of the new ordinance.

Full Day's Work for Jitneys.

Portland, Ore.—Jitneys hereafter will be required to operate eight hours each day and most of this time during the rush hours of evenings and mornings, according to an amendment to the jitney regulation ordinance passed by the unanimous vote of the council. Jitney licenses also will hereafter be issued quarterly instead of monthly, and during the quarter but one change of route on which a machine is operated will be granted. Whenever a car is found to be out of repair, it will be tagged by the jitney bus inspector and the owner will not be permitted to operate this car until it is placed in proper condition.

Jitneys Out of Business.

Chester, Pa.—Citizens are vigorously protesting against the Southern Pennsylvania Traction Company and city council because they are being compelled to walk several miles to reach their places of employment. This condition was brought about by the withdrawal of the jitney service from the city, council having passed an ordinance requiring the owners of jitney cars to file a bond for \$2,000, and to observe other conditions which all but a few of the jitney men were unable to fulfill. The traction company was notified several weeks in advance that they might expect a big rush of traffic when the jitneys were put out of business and the management of the lines promised to be ready to meet the conditions. The street railway officials fell so far short of their agreement that Mayor W. S. McDowell stated that unless the people were given the car service they required he would begin action to have the ordinance repealed.

MISCELLANEOUS

Municipal Lodging House.

Dallas, Tex.—The property of the Dallas city mission has been acquired by the city, Welfare Director Elmer L. Scott has announced, and the city hereafter will conduct a municipal lodging house there. While the capacity of the lodging house at first is small, being limited to sixty men, it is hoped from this beginning gradually to evolve a larger and more useful institution. Furniture and equipment of the lodging house is valued at \$550 and is free from debt. It includes kitchen and dining room equipment and beds. The mission has conducted a wood yard during the winter months. Sheds have been erected and are the property of the institution. Lodging and meals are provided in three ways. Persons stopping there pay in cash, pay by working in the wood yard, or if crippled and handicapped men, they are given free tickets from charitable organizations. A new use will be made of the lodging house since it has been taken over by the city. The Board of Health will use it as a temporary refuge for men who are convalescing after their discharge from city hospitals. Care of these men has been a problem. They are well enough to leave the hospital, but have no place to go. To keep them at Parkland or other hospitals has been very expensive. The cost of maintaining the lodging house during the summer months will not exceed \$100 per month.

It is expected to be self-sustaining during this period. Even with the winter months the deficit will be very small, it is figured, and it will be made up from the budgets of the municipal welfare department and the united charities. The actual net loss of operation of wood yard and lodging house during the period when meals were furnished in the lodging house from Nov. 1, 1915, to March 30, 1916, was \$1,021. The indications are that the lodging house as heretofore conducted with a wood yard five or six months in the year will be carried on at a net expense of about \$1,300 or \$1,400. The department of public welfare's budget appropriation is \$600. The federation of city-wide charities apports \$1,000 to the lodging house.

City Employees on Strike.

Providence, R. I.—The strike of 550 men in the public works department tied up the city's work for several days. The men asked for a \$2 a day minimum wage and a Saturday half holiday with pay and no extra work. The two houses of the city administration were long at loggerheads on giving in to the demands of the men.

A New City Planning Commission.

Santa Monica, Cal.—The new city planning commission has been organized and has begun its work. Mr. Gordon M. Lawson was elected president of the body and J. K. Lewis appointed secretary. The appointed members of the commission and their terms are: Gordon M. Lawson, one year; George D. Snyder, two years; A. Petsch, two years; J. J. Seymour, five years; C. M. Lindsey, five years. The other members are: S. L. Berkeley, commissioner of public safety; M. K. Barretto, commissioner of finance; W. H. Carter, commissioner of public works—all ex-officio; Francis J. Heney, city attorney, and John A. Morton, city engineer. Funds are to be provided by the city council who must approve all expenditures of such funds—but the commission may also receive bequests or gifts, which it may spend without authorization of the council. The powers of the commission include: Making of maps of the city for various purposes and phases of city planning; making recommendations to any individual or corporation in the city, with reference to location, architecture and use of buildings; preparation of building codes and division of city into zones; planning public improvements; passing on proposed building and sanitary ordinances and public utility franchises before the council.

A City Plan for Johnstown.

Johnstown, Pa.—The City Planning Commission has appointed Henry Hornbostel of New York as consulting city planner with George Wild, of this city, as assistant. Mr. Hornbostel has undertaken to furnish a comprehensive city plan, including all reports, sketches, perspectives and other details, for \$2,000. The field work is to be done by Mr. Wild, Mr. Hornbostel coming to the city at least once a week to supervise the work. Offices are to be established and a force of draftsmen employed.

New Comfort Station.

Lynn, Mass.—Lynn's first comfort station located on Lynn common near Shepard, is now complete and has been opened for public use. It is a one-story building, with a rough-cut face brick exterior with limestone trimmings and



Courtesy, Lynn (Mass.) Daily Evening Item.
NEW COMFORT STATION FOR LYNN.

LEGAL NEWS

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Paving Contractor—Right to Occupy Streets.

Law vs. Bryant Asphaltic Paving Co.—A paving contractor has the right to occupy the streets with a truck bearing a concrete mixer, and the mere fact that it thereby obstructs travel does not make him a wrongdoer or liable for the inconvenience to the public or to individuals.—Supreme Court of Iowa, 157 N. W. R., 175.

Local Improvements—Amount to Be Paid—Certificate and Approval.

McGillivrae et al v. City of Bremerton et al.—In the absence of fraud, the certificate of the city engineer and its approval by the council are binding and close the question as to the amount to be paid for making a local improvement, for which its actual cost and 10 per cent. added was agreed to be paid.—Supreme Court of Washington, 156 P. R., 23.

Validity of Election—Conclusiveness—Questions Involved.

Hunter et al. v. City of Roseburg.—The decree in a suit to test the validity of a city election, at which the city charter was amended to authorize the common council to construct a railroad from the city to a specified point, and to contract for the construction thereof, was not res adjudicata in a subsequent suit to cancel contracts entered into by the city which were not executed until after the first suit was instituted and were mentioned therein only in a general way.—Supreme Court of Oregon, 156 P. R., 267.

Limitation of Indebtedness—Mandamus.

Menar, Mayor, et al v. Sanders.—Const. § 157, providing that the tax rate of cities shall not at any time exceed the rate of 75 cents on the value of the taxable property therein in cities of less than 10,000 inhabitants, was intended to protect municipal corporations from their own extravagance, and applies only to indebtedness created or attempted to be incurred by contract, and not where the liability incurred is for a tort caused by or resulting from its own negligence; so that where a city suffered a judgment of \$2,000 in an action for personal injury from a defective street, mandamus would lie to compel it to levy and collect a tax sufficient to satisfy the judgment, interest, and costs.—Court of Appeals of Kentucky, 183 S. W. R., 949.

Improvements—Assessments—Constitutional Provisions— "City."

Ransome-Crummey Co. v. Woodhams.—Const. 1879, art. 11 section 19, provided that no public work or improvement should be done or made in any city upon or about the streets or otherwise, the cost and expense of which was chargeable or might be assessed upon private property by special assessment, unless an estimate of the cost and expense should be made and an assessment made, levied, collected, and paid before the work or improvements should be commenced. Held that, as the word "city" in another part of the same section has been construed to include

a German tiled roof. The windows are protected by iron grills. The interior is finished with an enameled brick dado, and with metal ceiling and sidewalls above. There is a standard granolithic floor. The entrances are screened from view by a trellis between brick posts. Between the compartments is a room fitted for the attendants and adjoining this is a heating plant. Commissioner George A. Cornet has planned to have granolithic walks laid as approaches to both entrances of the building, and about all four sides an attractive garden has been designed, which includes a planted vine, intended eventually to cover all sides of the building. An appropriation of \$7,000 was made for the building. Charles W. Wright was the contractor.

towns, it must be given the same construction in the provision in question, though the argument that the word was used in its narrow and restricted meaning as referring to larger and more populous and important centers than towns is persuasive.—District Court of Appeal, First District, California, 156 P. R., 62.

Licenses—"Common Carrier"—"Jitney Bus."

Huston v. City of Des Moines et al.—Jitney buses, which are automobiles carrying passengers between fixed termini, are common carriers doing an intrastate business, and, as such, are subject to reasonable regulation and control, which control involves the right to license or tax.—Supreme Court of Iowa, 156 N. W. R., 883.

Public Works—Mechanics' Liens—Evidence.

American Metal Ceiling Co., Inc., v. New Hyde Park Fire District, et al.—In a subcontractor's action against a municipal fire district, its contractor, etc., to enforce a mechanic's lien for metal work, evidence held to show that the parties contemplated that there should be but one contract and a common fund for payment, notwithstanding an additional resolution and appropriation, and intended to make the fourth payment to the contractor cover the metal ceiling, so that thereafter the additional appropriation was not specifically subject to the lien.—Supreme Court, Appellate Division, Second Department. 158 N. Y. S., 11.

Charter—"Liability."

Schultz v. City of Phoenix.—The "charter" of a corporation is its constitution or organic law giving to it all the powers it possesses, unless other statutes are applicable to it, and the municipality's liabilities, or exemptions from liability, must be found therein; so that if the corporation in the exercise of any of its powers or the performance of any of its duties incurs liability in delicto, whether arising from express legislation or by implication, it cannot escape such liability, unless relieved therefrom by some valid provision of its charter, and in a doubtful case a claim of exemption is to be resolved against it.—Supreme Court of Arizona, 156 P. R., 75.

Regulation of Bill Boards—Police Powers—Vested Rights.

People ex rel. Publicity Leasing Co. v. Ludwig, Superintendent of Buildings, et al.—A permit issued to defendant to erect an advertising sign on a roof, not to exceed certain specified dimensions. Thereafter the city council, by ordinance, restricted the size and height of such bill boards to a lower limit than that of the permit. The defendant had expended moneys in having plans made and in actual work upon the signboard contemplated, but had not built it to the specified height. After the passage of the ordinance, defendant assigned its right and sold its permit to the intervenor. Held, that the acts and expenditures of the defendant were not such as to create a vested right, relieving its assignee from observance of the ordinance.—Supreme Court, Appellate Division, First Department, 158 N. Y. S., 208.

Bonds—Election—Validity.

City of Oswego v. Davis, State Auditor.—Under a statute authorizing the issue of bonds for the extension and improvement of a municipal water plant, which provided that the notice of the election and the election ballot shall state the amount of bonds proposed to be issued, a city ordinance calling the election, the election notice, and the election ballot stated the proposition thus:

"Shall the mayor and councilman of the city of Oswego, Kansas, issue the bonds of said city in a sum not exceeding thirty thousand dollars, bearing 5% per annum interest, payable semi-annually, payable within twenty years from their date, in such manner as the mayor and councilmen may determine, for the purpose of improving the water supply plant and the system of said city."

Held, that this slight departure from the precision of statement required by the statute touching the amount of bonds to be issued does not render the proposed issue illegal nor preclude their registration.—Supreme Court of Kansas, 154 P. R., 1124.

Property Subject to Taxation—Outside City.

State ex rel. Hinson v. Nickerson, County Clerk.—Taxes cannot be levied upon property for city purposes after it has been detached from the city by the judgment of court of competent jurisdiction.—Supreme Court of Nebraska, 156 N. W. R., 1039.

Void Contract—Recovery on Quantum Meruit.

Armitage v. Essex Construction Co. et al.—Where the contract of a public corporation is set aside for irregularity, there may be recovery as on a quantum meruit against such corporation for reasonable cost and expense incurred in the prosecution of the contract before legal attack, irrespective of any benefit derived therefrom.—Court of Errors and Appeals of New Jersey, 96 A. R., 889.

Street Opening Proceedings—Publication—"Ten Days."

Tilton v. Decker et al.—Street Opening Act, § 18, requires that after the assessment for the street opening is written and filed with the city council, the council shall give notice by publication for at least 10 days. An affidavit of publication stated that notice was published for 10 consecutive days, Sundays excepted, commencing on the 8th day of October and ending on the 18th day. October 9th and 16th were both Sundays, and therefore there had been only 9 publications. Held, that the expression "publication for 10 days" does not require any specific number of publications, but merely designates a period of time in which publication is to be made, so the intervening Sundays are properly counted.—Supreme Court of California, 154 P. R., 860.

Sewer Contract—Liability of Contractor for Defect.

City of Richmond v. Jackson et al.—Where a contract for the construction of a sewer provided that the contractor should be under a duty to guard the work and be primarily liable for any damages the city should have to pay during the execution of the work and until its acceptance in writing by the city engineer, and also that the contractor should keep the work in repair for twelve months after its completion, but nothing in the contract required the contractor to protect the work during the twelve months after completion, there was no duty upon the contractor to guard the public against danger after the work had been accepted by the city engineer.—Supreme Court of Appeals of Virginia, 88 S. E. R., 49.

Accident—Condition of Streets—Negligence of Motorman.

City of Albany v. Brown.—The proximate cause of the damage to the plaintiff's automobile was the negligence of the motorman of the street railway company in continuing to run his car at a rapid rate of speed after he saw the perilous position of the automobile upon the street car tracks, when it was about 90 feet distant from the street car, and in making no effort to put on his brakes or otherwise to stop the street car, and in running upon and striking the automobile. The alleged negligence of the city of Albany, in leaving, in the street near the tracks where the injury occurred, a large pile of dirt, the striking of which by the automobile caused the automobile to be thrown upon the street car tracks in such a position that the chauffeur operating it could not move it forward or backward, under all the particular facts as alleged in the petition, was not such an act of concurring negligence as to make the city liable. The petition, failing to show any joint acts of negligence by the two defendants sued, or that there was any concert of action on their part in the alleged damage to the automobile, did not establish that they were joint tort-feasors, and the court erred in overruling the city's general demurrer to the petition. *Schneider v. Augusta*, 118 Ga. 610, 45 S. E. 459; *Bonte v. Postel*, 109 Ky. 64, 58 S. W. 536, 51 L. R. A. 187; *Mayor and Council of Macon v. Dykes*, 103 Ga. 847, 31 S. E. 443. The facts in this case distinguish it from the case of *Barrett v. Savannah*, 9 Ga. App. 642, 72 S. E. 49, and from the other cases cited and relied on by counsel for the defendant in error.—Court of Appeals of Georgia, 88 S. E. R., 215.

NEWS OF THE SOCIETIES

Calendar of Meetings.

- May 17-20.**—SOUTHWESTERN ELECTRICAL AND GAS ASSOCIATION. Annual convention, Galveston, Tex. Secretary, H. S. Cooper, Slaughter Bldg., Dallas, Tex.
- May 22-26.**—NATIONAL ELECTRIC LIGHT ASSOCIATION. Thirty-ninth Annual Convention, Chicago, Ill.
- May 22-27.**—NATIONAL EXPOSITION OF SAFETY AND HEALTH. Second annual exposition, New York, N. Y. Director-General, The American Museum of Safety, 14 West 24th Street, New York.
- May 23-26.**—OKLAHOMA STATE FIREMEN'S ASSOCIATION. Annual convention, parade and tournament, Cushing, Okla.
- May 31-June 2.**—NEW YORK STATE CONFERENCE OF MAYORS. Annual conference, Syracuse, N. Y.
- May 31-June 2.**—NATIONAL ASSOCIATION OF COMPTROLLERS AND ACCOUNTING OFFICERS. Annual convention, Syracuse, N. Y.
- June 5-7.**—NATIONAL CONFERENCE ON CITY PLANNING. Eighth annual conference, Hotel Statler, Cleveland, O. Secretary, Flavel Shurtleff, 19 Congress St., Boston, Mass.
- June 5-9.**—AMERICAN WATER WORKS ASSOCIATION. Thirty-sixth annual convention, Hotel Astor, New York City. Secretary, J. M. Diven, 47 State street, Troy, N. Y.
- June 12-16.**—SOUTH DAKOTA STATE FIREMEN'S ASSOCIATION. Annual convention, Yankton, S. D.
- June 13-15.**—MINNESOTA STATE FIRE DEPARTMENT ASSOCIATION. Annual convention, Chisholm, Minn.
- June 14-16.**—UNION OF SASKATCHEWAN MUNICIPALITIES. Annual convention, Swift Current, Sask. Secretary, W. F. Heal, Moose Jaw, Sask.
- June 14-17.**—AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. Eighth semi-annual meeting, Cleveland, O. Secretary, I. C. Olsen, Cooper Union, New York City.
- June 15, 16.**—OHIO SOCIETY OF MECHANICAL, STEAM AND ELECTRICAL ENGINEERS. Convention, Cleveland, O. President, Joseph L. Skeldon, Toledo.
- June 20-22.**—NORTH CAROLINA GOOD ROADS ASSOCIATION. Annual convention, Wilmington, N. C. Secretary, Dr. Joseph Hyde Pratt, Chapel Hill, N. C.
- June 20-22.**—SOUTH CAROLINA STATE FIREMEN'S ASSOCIATION. Annual convention, Orangeburg, S. C.
- June 21-23.**—TRI-STATE WATER AND LIGHT ASSOCIATION OF THE CAROLINAS AND GEORGIA. Annual Convention, Isle of Palms, S. C. Secretary-treasurer, W. F. Stieglitz, Columbia, S. C.
- June 27-30.**—IOWA STATE FIREMEN'S ASSOCIATION. Annual convention, De Witt, Ia.
- June 27-30.**—AMERICAN SOCIETY OF CIVIL ENGINEERS. Annual meeting, Pittsburgh, Pa. Secretary, Charles Warren Hunt, 220 West 57th St., New York, N. Y.
- June 28-30.**—MICHIGAN LEAGUE OF MUNICIPALITIES. Annual meeting, Battle Creek, Mich.
- June 27-30.**—AMERICAN SOCIETY FOR TESTING MATERIALS. Annual meeting, Atlantic City, N. J. Secretary, Edgar Marburg, University of Pennsylvania, Philadelphia, Pa.
- July 11-13.**—MUNICIPAL LEAGUE OF INDIANA. Annual meeting, Goshen, Ind.
- July 25-27.**—CENTRAL NEW YORK VOLUNTEER FIREMEN'S ASSOCIATION. Annual convention, Seneca Falls, N. Y. Secretary, Stewart W. Smythe, Cortland, N. Y.
- Aug. 7-9.**—CITY MARSHALS' AND POLICE CHIEFS' UNION OF TEXAS. Annual convention, Houston, Tex.
- Aug. 8-11.**—DOMINION ASSOCIATION OF FIRE CHIEFS. Annual convention, Windsor, Ont. Secretary, James Armstrong, Kingston, Ont.
- Aug. 21-27.**—PACIFIC COAST ASSOCIATION OF FIRE CHIEFS. Annual convention, San Diego, Cal.
- Aug. 29-31.**—LEAGUE OF CITIES OF THIRD CLASS IN PENNSYLVANIA. Seventeenth Annual Convention, Johnstown, Pa. Secretary, Fred H. Gates, City Clerk, Wilkes-Barre, Pa.
- Aug. 29-Sept. 1.**—INTERNATIONAL ASSOCIATION OF FIRE ENGINEERS. Annual convention, Providence, R. I. Secretary, James McFall, Roanoke, Va.
- Sept. 6-9.**—LEAGUE OF AMERICAN MUNICIPALITIES. Annual convention, Newark, N. J.
- Sept. 4-8.**—SOUTHERN APPALACHIAN GOOD ROADS ASSOCIATION. Ninth annual convention, Lexington, Ky. Secretary, Dr. Joseph Hyde Pratt, Chapel Hill, N. C.
- Sept. 13-15.**—NEW ENGLAND WATER WORKS ASSOCIATION. Convention, Portland, Me. Secretary, Willard Kent, Narragansett Pier, R. I.
- Oct. 9-13.**—AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS. Twenty-third Annual Convention, Robert Treat Hotel, Newark, N. J. Secretary, Charles Carroll Brown, 702 Wulsin Building, Indianapolis, Ind.
- Oct. 16-21.**—NATIONAL SAFETY COUNCIL. Fifth Annual Safety Congress, Detroit, Mich. Secretary, W. H. Cameron, Continental and Commercial Bank, Chicago, Ill.
- Feb. 5-12, 1917.**—AMERICAN ROAD BUILDERS' ASSOCIATION. Seventh American Good Roads Congress and Eighth National Good Roads Show, Mechanics' Hall, Boston, Mass. Secretary, E. L. Powers, 150 Nassau street, New York City.

Conference of Mayors and Other City Officials of New York State.

Syracuse will entertain more than 500 city officials on May 31st, June 1st and 2d, when the New York State Association of Comptrollers and Accounting Officers will meet to discuss municipal problems. The program has been arranged so that the two organizations will hold at least three joint sessions.

Governor Whitman has been invited to speak to both organizations at the first session on the subject, "The State and the Municipality." President Rosslyn M. Cox of the mayor's conference and President Thomas F. Boyle of the Comptrollers' Association will make their annual addresses. Mayor W. R. Stone of Syracuse will welcome the officials.

The feature of the Mayors' Conference this year will be a discussion of municipal finances. Deputy state comptroller Fred G. Reusswig will outline a uniform accounting system for third-class cities in this state. A committee of the conference has been working with the state comptroller on this system for some time. Mayor D. W. Wilbur of Poughkeepsie will open the discussion on this report. The need for uniform municipal health budgets will be presented by deputy state health commissioner Lindsay Williams and health commissioner F. E. Fronczak of Buffalo and health commissioner Horace M. Hicks of Amsterdam will open the discussion.

Comptroller Edward S. Osborne of Rochester will describe a proposed uniform municipal bond law for this state and mayor Edward S. Griffing of New Rochelle and corporation counsel Arthur L. Andrews of Albany will start the discussion.

The conference will continue its discussion of city planning problems. The subjects this year will be "The Need for Standard Units for Comparing Municipal Improvements" and "Limiting the Heights of Buildings and Restrict-

ing the Use of Property in Cities." The first subject will be discussed by A. Prescott Folwell, chairman of the committee on standard forms of the American Society for Municipal Improvements. City manager O. E. Carr of Niagara Falls and mayor Palmer Canfield of Kingston will open the discussion. The second subject will be argued by President Lawson Purdy of the New York City department of taxes and assessment.

State Commissioner of Education John Finley will address the conference on "The Attitude of the State Department of Education Toward the City Schools" and will be followed by mayor John Purroy Mitchel of New York City and mayor John Hoag of Salamanca. How the cities can increase their revenue by reducing the exemptions of real and personal property from taxation will be discussed by President Martin Saxe of the state tax department. Mayor Mark I. Koon of Auburn and mayor F. M. Thompson of White Plains will open the discussion.

T. Chalkley Hatton of the sewage commission of Milwaukee will describe that city's successful experiments with the activated sludge method of sewage disposal. As every New York state city is now interested in the establishment of a sewage disposal plant keen interest is being taken in this feature of the program. Chief engineer Glenn D. Holmes of the Syracuse intercepting sewer board and commissioner of public works John Giles of Binghamton will open the discussion.

Mayor James T. Lennon of Yonkers will discuss the work of the state bureau of municipal information since its organization last September, and mayor Harry N. Hoffman of Elmira will present the conference committee's program and recommendations for the reduction of unemployment in New York state cities.

American Association for Promoting Hygiene.

At the election of officers of the American Association for Promoting Hygiene and Public Baths at the annual meeting held at Baltimore May 10 Dr. Joseph E. Gichner of Baltimore was made vice-president; Dr. Simon Baruch of New York was re-elected president and J. Leonard Mason of Newark and August P. Windolph of New York were both continued in office as secretary and treasurer, respectively. New members of the board of directors are Col. F. H. Hyde of New York, W. F. Ashe of Pittsburgh, Dr. W. A. Manheimer of New York, E. L. Penfrase of New York and C. A. McCall of Newark. The other directors are: Oregon Milton Dennis of Baltimore, Mr. Mason and Mary A. Jacobson of Newark. J. Wells Wentworth of New York will again serve as corresponding secretary.

One of the most important papers was that by Dr. Francis E. Fronczak of Buffalo on "The Availability of the Waterfront for Public Baths," which was presented by Dr. J. H. Donnelly of the Buffalo health department.

Col. Frank H. Hines, superintendent of public buildings of the borough of Manhattan, spoke in an instructive way about the benefits derived from New York's floating bathhouses, and Dr. S. Danzer of the Vanderbilt clinic read a paper in which he showed the value of cold baths as an antidote to fatigue.

Other addresses were those of Dr. Manheimer on "The Comparison of Methods for Disinfecting Swimming Pools"; Jennie Wells Wentworth, secretary of the department of public works, New York, on "Public Markets," and Robert F. G. Kelley, secretary of the public bath commission of Baltimore on "Portable Bathhouses."

National Electric Light Association.

Coincident with the thirty-ninth annual convention of the National Electric Light Association to be held in Chicago May 22 to 26, there will be an electrical exhibition in the Auditorium Theatre, at which will be displayed electric vehicles of all types, both passenger and commercial, and accessories, batteries, charging apparatus, etc. The National Electric Light Association, with whom the Electric Vehicle Association of America affiliated recently, will co-operate in every way possible toward the exploitation of electric vehicles.

The exhibition committee has announced the arrangements made for the display of electric vehicles and accessories. The exhibits will be located in the Auditorium Theatre, which is a part of the Auditorium Hotel. There are entrances to the exhibition floor from any part of the hotel, and it is also connected with the Congress and Annex hotels by a tunnel, making an exceptional arrangement both for members as well as exhibitors.

League of Louisiana Mayors.

The second annual convention of the League of Louisiana Mayors was held at Baton Rouge May 1 and 2. By a vote of 7 to 6 New Iberia was chosen over Shreveport as the meeting place of the 1917 convention. Mayor Grouchy of Baton Rouge was elected president of the league; Lem I. Kahn, Shreveport, vice-president; mayor Elam of Mansfield, secretary; mayor Lemann of Donaldsonville, treasurer; mayor Dickson of Shreveport, mayor Gamble, Jennings, and mayor Whittington, Alexandria, members of the auditing committee.

Four members of the league who were on the program for talks were unable to attend. They were mayor H. F. Bradford, Pineville; E. L. Loeb, Opelousas; J. K. Johnson, Bogalusa, and E. Stockner, Lake Providence. Upon suggestion of mayor Behrman the league decided hereafter to print a monthly or quarterly journal, to keep its members in touch with the work of the cities which are members and the official business of the organization throughout the year. Secretary Elam will have charge of the publication,

(Continued on page 703.)

PERSONALS

Blake, Lucien, electrical engineer, died May 4 in the Boothby Hospital in Boston, Mass., in his sixty-second year. He was the inventor of the telegraph used by submarines, and had patented a number of other widely used electrical devices. Mr. Blake was born in Mansfield, Mass., and after being graduated from Amherst College in 1877 attended the University of Berlin. Following this he was professor of physics and electrical engineering at the Rose Polytechnic Institute in Terre Haute, Ind., and during 1887-1906 occupied the same chair at the University of Kansas. In 1893 he was appointed constructing electrical engineer to the United States Light House Board, and during 1906-1907 was chief engineer of the Submarine Signal Company of Boston.

Kennedy, Michael J., former park commissioner for Brooklyn and Queens, died May 13 at his home in Brooklyn in his fifty-eighth year. He was born in Ireland and came to this country with his parents when three years old. He was in the firm of Kennedy & O'Connell, dock builders. In 1902 he was one of the organizers of the Brooklyn Democracy and took an active part in the election of Seth Low as mayor. He was then appointed a member of the board of education, from which he resigned to become park commissioner in 1904.

Stanley, William, an electrical engineer, whose inventions made possible the transmission of power and light over long distances, and holder of the Edison medal, regarded as the highest award for electrical attainments in this country, died May 14 at Great Barrington, Mass., in his fifty-ninth year. When he was 32 years old he became internationally famous for building the first alternating current device adapted to the transmission of light and power to great distances. Mr. Stanley was born in Brooklyn. He was graduated from the Williston seminary at Easthampton, Mass., and entered Yale University with the class of 1881. Becoming interested in electricity, Mr. Stanley left the university before the completion of his course and took up experimental work. Not long after this he invented his alternating current device, which was soon followed by the electrical transformer now in general use. During 1885-88 Mr. Stanley was chief engineer of the Westinghouse Electric Company, and in 1890 became head of the Stanley Electric Manufacturing Company, where he remained for five years. For the next three years he was a consulting electrical engineer, and then, in 1898, became head of the Stanley Instrument Company, with which he was connected until 1903.

Weeks, W. Holden, deputy fire commissioner of New York City, died May 12 in a street car. His death was due to heart disease.

Dr. Elmer L. Corthell of North Egremont, Mass., president of the American Society of Civil Engineers, and one of the most noted civil engineers of this country, died May 16 at Albany, N. Y., after an illness of several years.

Corthell had spent two years at Brown University, when he enlisted during the civil war. After the war he returned to his studies and was graduated from Brown in 1867. The following year he was given his master's degree and in 1894 he received the honorary degree of Doctor of Science.

Mr. Corthell immediately took up engineering work, and became successively assistant engineer in charge of the construction of the Hannibal & Naples Railroad, in Illinois; division engineer of the Hannibal & Central Missouri Railroad; chief assistant engineer, building the bridge over the Mississippi River at Hannibal, Mo.; chief engineer of the Sny Island levee, and chief engineer, constructing the Chicago & Alton Railroad bridge across the Mississippi at Louisiana, Mo., with a draw of 444 feet, then the longest in the world.

In 1875 Mr. Corthell took charge for James B. Eads of the engineering and construction of the jetties at the mouth of the Mississippi River, where he spent four years, and, in addition to this, established the thirty-foot depth of South Pass, which increased the shipping facilities of New Orleans and made it a first-class port. Shortly after he built the New York, West Shore & Buffalo and the New York, Ontario & Western railways into New York.

During 1889-90 he built the St. Louis Merchants' bridge over the Mississippi, and the jetties at the mouth of the Brazos River, in Texas, where it enters the Gulf of Mexico. Then he was in charge of the difficult construction of "the independent entrance" into Chicago of the Illinois Central and Atchafalaya, Topeka & Santa Fe railways, which involved changing from a one-track to a six-track line, at one of the most complicated and congested track situations in the country.

For eleven years he was engineer of the Boston, Cape Cod and New York Ship Canal across the Isthmus of Cape Cod.

He also did extensive work in Mexico and Argentina, acting as consulting expert to the latter government in railroad and harbor improvements.

Mr. Corthell was a member of many scientific and other societies, among which were the Canadian Society of Civil Engineers, the Institution of Civil Engineers of Great Britain, the Society of Arts of Great Britain, the Mexican Association of Civil Engineers and Architects, the American and National Geographic Societies, the Boston Society of Civil Engineers, the Western Society of Civil Engineers, of which he was president in 1889; the Engineers' Club of Rio de Janeiro, the American Railway Engineering Association, and the American Institute of Consulting Engineers.

He was the author of a great number of engineering works.

NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

AERIAL LADDER

With New Automatic Spring Hoisting Mechanism.

The fire department of the city of Providence, R. I., recently installed an automobile aerial truck which utilizes a newly developed principle of handling the ladder. It is claimed to be much more effective, simpler and quicker in operation than the hoisting and lowering devices in other types. The ladder may be raised and lowered and the turn-table swung, all from the ground. The ladder is raised by powerful springs, the action of which is positively and quickly controlled by a new method of

governing not depending on air, liquid or screw. No segments or gear wheels are used in the raising mechanism.

In order to elevate the aerial ladder it is only necessary to release by hand lever the clutch attached to the cross shaft at front of the turn-table by means of which the ladder is held in place. The expansion of the springs then elevates the main ladder in four seconds, the ladder being under the absolute control of the operator through the hand lever attached to a powerful internal expanding band brake placed on the heel of the ladder and mounted directly upon the hub encircling the eccentric shaft.

For lowering the ladder there are bevel gears mounted on a shaft running crossways at the ends of the cylinders operated by cranks.

The direct control is down on an exact level with the springs, eliminates friction or loss of power incident to screw governor operation above the base of power. This makes for ease, rapidity and steadiness. Arms which are placed upon each side of a stationary screw which is located at the turn-table and is attached to a travelling nut run back and are attached to the crosshead of the plungers, which are pushed out by springs automatically as the ladder rises. There is in the end of each tube an adjusting screw. This screw is to be taken up or let out on the springs to insure the exact pressure necessary to raise the ladder. All whipping of the ladder is eliminated. This adjustment is made on the out-

side with a wrench furnished for that purpose.

The accompanying illustration shows the new Providence truck with the ladder raised and the insert shows a close view of the ladder raising mechanism when the ladder is closed down. The apparatus is made by the Combination Ladder Company, 336 Fountain street, Providence, R. I.

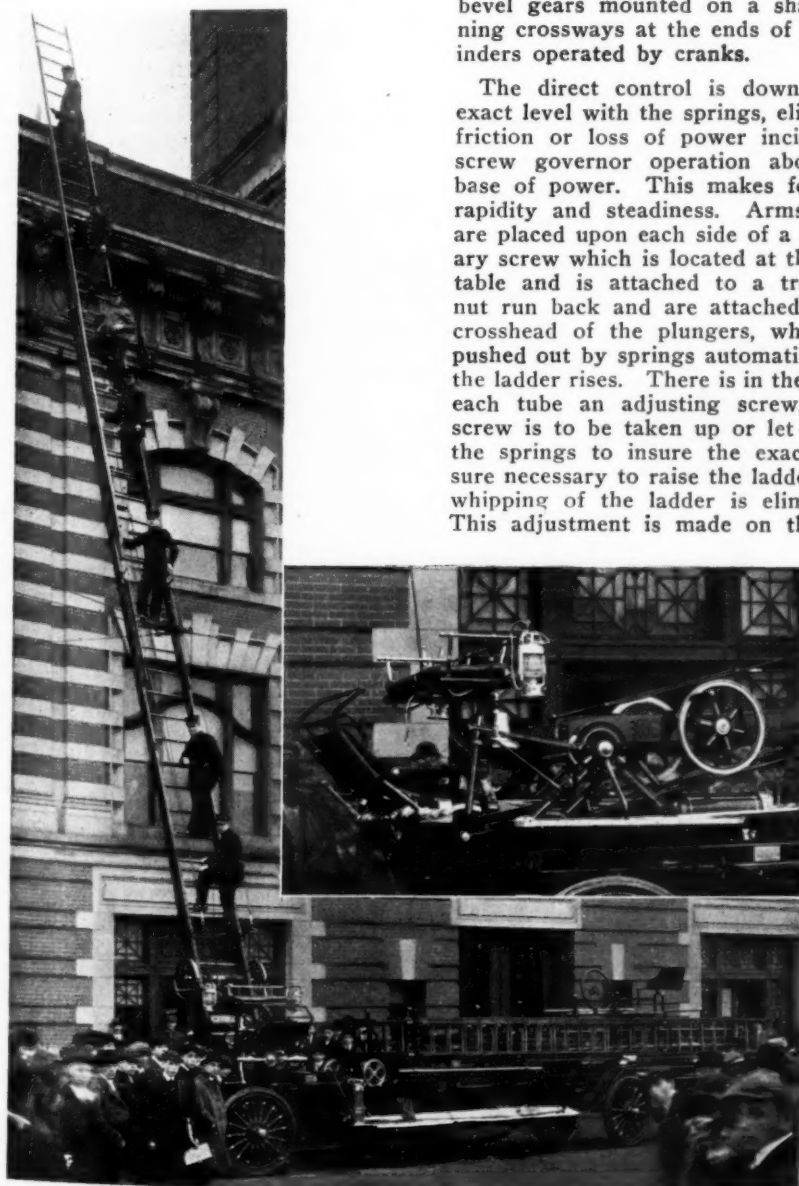
STREET SIGNS.

A Number of Styles with the "Interlocking" Device.

A good street sign system requires that the signs be located in convenient and uniform positions; that they be easily read from any direction; that they be understandable and not ambiguous; that they be durable in construction, able to stand exposure to weather and not liable to be twisted out of position so as to mislead as to the direction to which they refer. The Mathews "interlocking street sign device" is designed to make possible these requirements and is claimed to have all the qualities indicated. The device will hold sign plates at any desired angle, without the use of bolts, screws and rivets, in any number or size which is likely to be needed and in such a way that they will present a clear, clean face to view. The signs are made entirely of metals not affected by the action of the weather. They are artistic in design, pleasing in appearance and calculated to add to the attractiveness of the street they mark.

The Mathews signs are made in a number of styles adapted to various purposes. Style BB is made of 10 feet of two-inch (inside diameter) iron pipe with a $\frac{5}{8}$ -inch bolt through the bottom. The holding device is made of heavy galvanized iron throughout, so that rust cannot disfigure the sign. The plates may be had in one of two types: with vitreous porcelain enamel or the "Indestructible" aluminum letter. The former is made of charcoal iron with vitreous porcelain enamel in any two colors desired. It is attractive, clean, easily read and durable. The other type of plate is made of galvanized iron, treated with a waterproof paint, on which are securely riveted letters made of pure aluminum. The average and standard size for street plates is 4x20 inches.

The Style A sign is furnished where posts or standards are already in use and consists of a fitting, holding device and plates of either type. Style AA is similar except that the sign plate is furnished only in enamel and has a



NEW AUTOMATIC SPRING HOISTING AERIAL.

white border around a blue field with white letters.

Style C is designed to be attached to existing utility poles and is very effective, readily seen and economical. The bracket arm is made of heavy galvanized iron and will stand a dead weight of at least 150 pounds. The fixture is constructed of galvanized parts throughout and the plates may be had of either type. Style D is for use on iron trolley poles. It is of the same design and construction as Style C, except that pole castings, bands, etc., are added. Street signs are also furnished for nailing on walls, trees, poles, etc.

"Indestructible" highway signs are made with the aluminum letter plates, the letters being 3 or 4-inch, securely riveted with aluminum rivets to the galvanized iron plate. Plates are made with one to six words each and to read from one, two, three or four directions. They are especially designed to stand hard highway wear.

Danger signs and warning signs of various types, traffic signals, safety signs, etc., are made in the same way.

The accompanying illustrations show two styles of "Keep to the Right" signs and the Style AA street sign. The signs described are made by the Mathews Interlocking Sign Company, White Plains, N. Y.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago—Awards being made include 300 tons at Middletown, O., 300 tons of high-pressure pipe at Detroit, 500 tons at Elyria, O., and 300 tons at Winterset, Kans. The leading interest will supply 150 tons for Mount Horeb, Wis. Quotations: 4-inch, \$33.50 to \$34; 6-inch and larger, \$30.50 to \$31; class A, \$1 extra. Birmingham—The leading maker reports only an ordinary aggregate of new business. Another pipe company has received a number of orders from Texas, Nebraska, Iowa and other western states and reports a generally active buying movement, which, although not marked by large specifications, is of good volume. A. H. Campbell and others have completed the organization with \$75,000 capital of the National Pipe & Foundry Company at Gadsden, which will build a sanitary pipe shop. Two makers name \$29 and \$26 as the prices per net ton for 4-inch and 6-inch and up f.o.b. shops, but one other quotes \$28 and \$25; 16-foot lengths, \$1 extra. New York—Municipal lettings are disappointingly slow. The city of Poughkeepsie, N. Y., opens bids May 18 on about 2,000 tons. Private buying, however, appears to be making up to a great extent for the slackness in purchase by municipalities, as the demand is continuously good. Prices are well maintained. Quotations: 6-inch, class B and heavier, \$30.50; class A, \$31.50.

Lead.—Lead is unchanged and quiet but steady. Quotations: New York, 7.50 cents; St. Louis, 7.375.

The Southern Clay Manufacturing Company, Chattanooga, Tenn., has purchased the Graves Paving Brick plant at North Birmingham, Ala., and will at once begin making wire-cut lug brick at that place. The company already has plants at Nebbins, Tenn., and Coaldale, Ala. The growing demand for this type of brick in the South has necessitated the purchase of the additional plant.

The International Gas Engine Company, which has been one of the subsidiary companies owned by the International Steam Pump Company, together with all the other properties owned by them, have been merged into one general company, under the name of the Worthington Pump & Machinery Corporation, the reorganization of which was recently announced in these pages. The new company will take over all the properties and assets of: International Steam Pumping Company—Snow Steam Pump Plant, Buffalo, N. Y.; Deane Steam Pump Plant, Holyoke, Mass.; Laidlaw-Dunn-Gordon Plant, Cincinnati, O.; Blake & Knowles Steam Pump Works, East Cambridge, Mass.; Power & Mining Machinery Co., Cudahy, Wis.; International Gas Engine Co., Cudahy, Wis.; Fred M. Prescott Steam Pump Co., Milwaukee, Wis.; Jeanesville Iron Works Company, Hazleton, Pa., and will act as

sales agent for Henry R. Worthington, whose operation will be under the direction of the Worthington Pump and Machinery Corporation.

The capitalization of the new corporation is \$36,000,000. Mr. W. H. Day, sales manager of the International Gas Engine Company, states that the gas engine branch of the business will continue the same as heretofore, only on a larger scale, manufacturing tractor, gas, gasoline and oil engines, from 1½ to 60 H.P., under the "Ingeco" trade-mark.

The "Ingeco" engine line has acquired a large distribution among the better class of dealers throughout the country and has an excellent reputation.

The E. I. du Pont de Nemours Powder Co., Wilmington, Del., has issued an interesting little book of 120 pages dealing with "Road Construction and Maintenance." It describes in simple terms the principles of good road building, methods used in construction and maintenance and equipment required. It emphasizes its points almost on every page with many illustrations of what to do and how to do it and examples of work done. It also catalogues information about the du Pont blasting outfits for road work.

Tire Making Machine Patents.—The tire industry is much interested in F. A. Seiberling's victory over the Firestone Tire & Rubber Company in the U. S. District Court, in a suit charging



MATHEWS "INTERLOCKING" STREET SIGNS.

infringement of the Seiberling-Good-year tire-making machine patents. Interest in this suit brought by F. A. Seiberling, president of the Goodyear Tire & Rubber Company, Akron, O., against the Firestone Company was unusually heightened because of the fact that while a large majority of tire manufacturers, both large and small, have been for some years building their tires upon machines licensed from Mr. Seiberling, a small handful of other manufacturers, among which was the Firestone Company, have refused to concede the validity of the patents on the Goodyear machines. The Goodyear Company contended that the Seiberling-Stevens machine of 1902-3 was a pioneer invention and that it paved the way for the present day semi-automatic tire making machine; that the Seiberling-Stevens machine was the first ever produced to make automobile tires; that the Goodyear Company developed the first practical machine for making automobile tires mechanically that is now in use. This Goodyear position is now confirmed by the decision of Judge Killits of the U. S. District Court.

NEWS OF THE SOCIETIES

(Continued from page 700.)

which will be self-supporting, through the advertising it will carry.

In order to increase membership, the entire state is to be divided into districts or sections by the secretary, every mayor who is a member of the league will be asked to see the councils of towns not members and induce them to join.

Among the papers presented were the following: "Taxation and Assessment," Martin Behrman, New Orleans; "Street Paving," H. S. Sealy, New Iberia; "Street Lighting," W. W. Whittington, Alexandria; "Judicial Decisions," Joseph B. Elam, Mansfield; "Municipal Franchises," John Gamble, Jennings; "Municipal Accounting," Alexander Grouchy, Baton Rouge; "Municipal Ownership," S. A. Dickson, Shreveport; "Public Health," E. S. Matthews, Bunkie; "Membership," Walter Lemann, Donaldsonville.

New Jersey State League of Municipalities.

Following conferences with officials of the financial department of the larger cities of the state, the executive committee of the New Jersey State League of Municipalities has planned to prepare a program of legislation to improve municipal financing methods. A special committee to whom the work has been assigned consists of Spaulding Frazer of Newark, Mayor Frederick W. Donnelly of Trenton and Mayor George N. Seger of Passaic.

The executive committee has decided to devote an entire session of the mid-summer meeting to be held at Asbury Park in July to consideration of financing methods. President Wilson will

be invited to address one of the meetings of the league, in which 128 municipalities of the state are now represented.

Professor Evans Clark of the department of history and politics of Princeton University was elected at a recent meeting director of the league's bureau of municipal research, which will be established in the university library. The trustees of the university have agreed to co-operate with the league in establishing a municipal reference section, consisting of documents and statistics bearing on problems of municipal government.

An advisory board of nine members will be appointed by the university to give advice and counsel to the bureau of information. If possible similar co-operation will be obtained from Rutgers College and Stevens Institute of Technology.

Pennsylvania Association of Police Chiefs.

The third annual convention of the chiefs of police of the state of Pennsylvania was held at Williamsport May 2 and 3, a large number of the chiefs being present.

Election of officers resulted as follows: President, J. N. Tillard, Altoona; vice-president, former chief of police C. F. Evans, of this city; secretary and treasurer, former chief of police George W. Harder, of this city. The following were elected members of the executive committee: M. C. Turney, inspector of police of the Pennsylvania Railroad, and Manfred Naar, of Philadelphia, of the Philadelphia and Reading railroad police.

Philadelphia has been selected as the next place of meeting, the matter of time being left to the executive committee.

Chief of Police F. W. Tepel, of Williamsport, introduced a resolution authorizing the appointment of a committee to look into the matter of securing better and more uniform traffic regulations for the state of Pennsylvania. From the discussion which this provoked this problem is by no means confined to any one locality, difficulties along the lines of such regulation seeming to be the rule in every community. President Tillard appointed the following committee: Chairman, Fred W. Tepel; J. Thomas Zeil, of Harrisburg; chief of police Day, of Scranton; Romanus Fellman, of Norristown, and L. B. Reifsnyder, of Pottstown.

One of the events of the session was the address made by Major Richard Sylvester, of Washington, D. C., for a number of years chief of police of the metropolitan department of the capital city, and also president for 15 years of the International Association of Chiefs of Police. His address dwelt with the history of the formation of the workings of and the purpose of the Federation of American Peace Officers. This organization, of which Major Sylvester is the head, was formed last June, at Cincinnati, O., at a joint meeting of the

International Association Chiefs of Police, the International Association of Railway Special Agents and Police, and the International Sheriffs' Association. Following the address the convention passed a resolution endorsing the official publication of the organization and the association itself.

A committee was appointed to look after the matter of securing better legislation for the police departments of boroughs, etc.

The work of the police department of the city of Philadelphia was described at length by Major James Robinson, of Philadelphia, who detailed the progress that has been made in police work and procedure in that city.

Major Sylvester and Chief of Police Zeil, of Harrisburg, were elected to life membership in the association.

A very comprehensive report was delivered at the opening session by President James N. Tillard, who covered the work done during the past year. He touched upon the changes in office during the past year, due to the change of administrations in third class cities and other cities; the civil service bill; pensions, efficiency, various kinds of crimes, state police, etc.

"The matter of pensions for policemen," he stated, "of the entire state is also a matter that should receive the profound attention of all members. Last year Superintendent Robinson had introduced in the legislature a bill that would have benefited every policeman in the state from the village up to the large city. The bill failed because of lack of support from the country members.

"The police department, especially in small municipalities, has more trouble to secure consideration, even from their own municipal council, than any other department, for the reason that nearly all men have an unanalyzed feeling that the policeman is but a necessary evil at the best and is to be endured rather than cordially supported.

Carolina Municipal Association.

Raleigh was chosen for the 1917 meeting place of the Carolina Municipal Association at the annual convention held at Kinston May 5. The time was left open.

Mayor Murphy of Greensboro was re-elected president. Mayor Sutton of Kinston was elected secretary-treasurer.

The following were named for vice-presidents: Mayor Johnson of Raleigh, mayor-elect McNeill of Fayetteville, O. P. Shell of Dunn, mayor Skinner of Durham, commissioner Ramsey of Asheville and mayor Dunn of Greenville.

Speakers and subjects were: Mayor Bibbs of Fayetteville, "Parks and Playgrounds"; commissioner Merritt of Wilmington, "Streets and Roads"; Gilbert White of Charlotte and Durham, "Streets and Roads"; Sherwood Brockwell of Raleigh, "Fire Prevention"; Edward Young Clarke of Atlanta, "The New South."

ADVANCE CONTRACT NEWS

ADVANCE INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
O.	Cable	2 p.m., May 20	Graveling roads (county furnishes gravel)	W. E. LaRue, Clerk, Township Trustees.
Ind.	Ft. Wayne	10 a.m., May 20	Road oils and bituminous binders for surface treatment of roads	Will Johnson, Co. Aud.
S. D.	Deadwood	10 a.m., May 20	7 road grading jobs, 40,000 cu. yds.	Fred Harris, Co. Auditor.
O.	Linden Heights	May 20	Paving with bituminous macadam, cost \$70,000	R. K. Schlafly, Engr., Colum bus, O.
Kan.	Lindsborg	May 20	21,000 ft. concrete curb and gutter	H. A. Rowland, Engineer, McPherson, Kan.
Pa.	Hazleton	May 20	39,000 sq. yds. Amiesite, brick, wood or asphalt pavement, cost \$79,000	City Engineer
Ill.	Brocton	2 p.m., May 20	Constructing 9,200 ft. rock and gravel road	K. J. Barr, County Hwy. Supt., Paris, Ill.
Minn.	Henderson	May 20	Graveling and grading state roads	Philip Krehler, Comr.
Conn.	Stamford	8 p.m., May 22	16,000 square yards pavement	City Clerk.
Ill.	Marshall	2 p.m., May 22	23,500 sq. yds. brick pavement and 10,000 ft. concrete curb and gutter	Bd. of Local Improvements.
Tenn.	Nashville	11 a.m., May 22	500,000 gals. bituminous materials	A. L. Nelson, Engr., 405 7th. Av.
O.	Youngstown	1 p.m., May 22	14,220 ft. slag macadam	F. H. Vogan, Clerk, County Commissioners
Quebec	St. Lambert	noon, May 22	Paving two streets	E. Drinkwater, Town Engr.
N. C.	Bakersville	May 22	Four miles macadam road, 18 ft. wide	Bd. of Road Commissioners
Kan.	Tonganoxie	May 22	2,730 sq. yds. concrete pavement and 1,900 ft. conc. curb	City Clerk
N. J.	Passaic	10:30 a.m., May 22	5,040 sq. yds. sheet asphalt and 260 sq. yds. gran. block	City Engineer.
Minn.	St. Paul	10:30 a.m., May 22	Grading Tracy Ave.	Aug. Hohenstein, Pur. Agent.
Wash.	Olympia	May 22	Surfacing with gravel or shale, 4½ miles	Jas. Allen, State Hwy. Comm.
Md.	Cumberland	May 22	Paving and improving streets	R. L. Rizer, City Engr.
Pa.	Carbondale	May 22	50,000 sq. yds. brick pavement and 3,000 sq. yds. bituminous macadam	J. A. Saxe, City Engr.
Ind.	Kokomo	May 22	Oiling streets	Ben Havens, City Clerk.
Ind.	Indianapolis	10 a.m., May 22	Furnishing cement, gravel, sand, and reinforcing metal	L. K. Fesler, Co. Aud.
Md.	Baltimore	noon, May 23	2,000 cu. yds. of grad.; painting 28,000 ft. of guard rail	State Roads Commission.
Ind.	Warsaw	May 23	Paving three miles of streets	City Engineer.
O.	Loudonville	noon, May 23	Improving four streets	City Clerk.
Minn.	Luverne	10 a.m., May 23	Grading and surfacing state road	Olaf Skyberg, Co. Auditor.
Ind.	South Bend	10 a.m., May 23	Paving with gravel, curbing and constructing walks	Veronica Sweeney, Clerk, Bd. of Public Works.
N. J.	Fair Haven	May 23	60,000 sq. ft. concrete sidewalks and 16,000 ft. conc. curb	A. C. Swift, Boro Engr., Red Bank
N. J.	Jersey City	May 23	Paving with asphalt	M. I. Fagen, City Clerk
Kan.	Atchison	noon, May 23	2½ miles macadam or concrete; 10,000 cu. yds. excav.	S. K. McCrary, Bridge Engr.
N. Y.	Lockport	2 p.m., May 23	Improving 13.5 miles of road	F. H. Krull, Clerk Bd. of Supervisors.
O.	Fayette	noon, May 23	Concrete, asphalt block or brick pavement	C. D. Hause, Village Clerk.
Ill.	South Dixon	2 p.m., May 23	Macadamizing Peoria Road	Highway Commissioners.
Minn.	Henderson	May 23	Grading and graveling state roads	Philip Krehler, Comr.
Neb.	Omaha	10 a.m., May 23	Paving with hard surface pavement	City Engineer.
Wis.	Racine	2 p.m., May 23	Constructing macadam road	James Mutter, Co. State Hwy. Comr.
Va.	Eastville	2 p.m., May 24	Grading and surfacing with sand-clay 14 miles	Mack Galbreath, Engr.
Minn.	Crookston	2 p.m., May 24	Grading and installing culverts	H. J. Welte, Co. Auditor.
Minn.	Lancaster	8 p.m., May 24	Road grading, 4,960 cu. yds. excavation	Geo. Vanstrom, Village Clerk.
O.	Cleveland	10 a.m., May 24	Grading and improving streets	W. A. Stinchcomb, Co. Surv.
Pa.	Union City	8 p.m., May 24	Curbing and paving 1,560 ft. of streets	H. B. Johnson, Boro Sec'y.
N. Y.	New York	11 a.m., May 24	Repaving and paving with asphalt and granite and laying sidewalks	Com'r of Public Works.
O.	Cleveland	noon, May 24	Grading, curbing and paving	Com'r of Pur. & Supplies.
Mich.	Belding	2 p.m., May 24	Paving streets	City Clerk.
Pa.	Reading	10 a.m., May 24	54,000 sq. yds. of paving and 8,000 sq. yds. of resurf.	E. G. Ulrich, City Engineer.
Kan.	Wichita	May 24	Paving two streets with brick	Bert Wells, City Engineer.
O.	Mansfield	May 24	Paving with brick and with tarvia	City Engineer.
La.	Marshalltown	9 a.m., May 24	Paving on 16 streets with gravel and concrete	W. H. Hazeltine, City Engr.
O.	Tiffin	Noon, May 24	About 15,000 sq. yds. brick pavements	Wm. Heller, Dir. Pub. Serv.
Fla.	Sarasota	May 24	Change of date for road construction	C. A. Browne, Dist. Engr.
O.	Lima	May 25	Street paving, to cost \$500,000	A. L. Metheany.
O.	Youngstown	noon, May 25	Paving and grading streets	City Engineer.
N. J.	Newark	May 25	Curbing, flagging, grading and paving with bitulithic	M. R. Sherrerd, Chief Engr.
Ind.	Rushville	2 p.m., May 25	Concrete, brick, and macadam roads	County Auditor
Ind.	Evansville	10 a.m., May 25	Constructing two stone roads	County Auditor
Ind.	Winchester	10 a.m., May 25	5 miles stone and gravel road, 3 jobs	County Auditor
Ind.	Indianapolis	10 a.m., May 25	Constructing road	L. K. Fesler, Co. Auditor.
Ill.	Polo	noon, May 25	8 miles macadam road	A. Anderson, Co. Hwy. Supt.
Minn.	Hallock	8 p.m., May 25	Clearing and grading 2,500 cu. yds. excavation	F. J. Wickie, Village Clerk.
Ind.	Hammond	10 a.m., May 26	Macadamizing, grading and constructing walks and gutters	Board of Public Works.
Ind.	North Vernon	May 26	10,000 sq. yds. brick pavement	Charles Miles, City Engineer.
Ill.	Polo	noon, May 26	10 miles waterbound macadam road	A. Anderson, Co. Hwy. Supt.
Ind.	Warsaw	10 a.m., May 26	Concrete and gravel road	County Auditor
Man.	Virden	6 p.m., May 26	Grading 24.5 miles and graveling 9.5 miles	Wm. Whiteford, Secy.-Treas.
Ind.	Warsaw	1 p.m., May 26	Constructing gravel roads	V. D. Mock, Co. Auditor.
Ind.	Bluffton	May 26	Paving streets, cost \$36,000	T. C. Guldin, City Engineer.
Wash.	Tacoma	11 a.m., May 26	Paving with brick, concrete, Warrenite or bitulithic for 6 miles	T. N. Morris, Co. Auditor.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
W. Va.	West Union	May 26	Constructing several roads	Horner Bros., Engrs., Clarksburg, W. Va.
O.	Cincinnati	noon, May 26	Repairing county roads	Albert Reinhardt, Clerk, Co. Commissioners.
Ind.	Rushville	May 26	Oiling city streets	City Clerk.
La.	Houma	May 27	Constructing 12 miles of road, cost \$45,000	T. B. Smith, Engineer.
Ind.	Muncie	10 a.m., May 27	Constructing gravel and macadam roads	F. M. Williams, Co. Aud.
Wash.	Tacoma	11 a.m., May 27	Grading and paving two miles	T. N. Morris, Co. Auditor.
O.	Cleveland	10 a.m., May 27	Improving Euclid Avenue	W. A. Stinchcomb, Co. Surv.
Minn.	Williams	2 p.m., May 28	Clearing and grubbing road	J. R. Norris, Town Clerk.
O.	Lockland	noon, May 29	Grading, paving with brick and constructing curbs and gutters	R. H. Rolet, Village Clerk.
N. D.	Mott	May 29	Grading road	E. C. Roberts, Co. Auditor.
O.	Cleveland	noon, May 29	Driveways and sidewalks at 7 schools	Clerk, Bd. of Education.
Ind.	Kokomo	May 29	Oiling streets; paving alleys	Ben Havens, City Clerk.
Wash.	Everett	May 29	Paving 7.5 miles of road	Mae Weatherbee, County Aud.
Wash.	Seattle	May 29	Grading and surfacing 7.7 miles, cost \$50,000	Byron Phelps, County Aud.
W. Va.	Lumberport	May 29	Paving streets, \$20,000 available	City Clerk.
Tex.	Coldspring	May 30	Constructing 24 miles sand-clay and gravel roads	L. S. Bryant, Engr., Shepherd, Tex.
O.	Columbus	noon, May 31	Drainage and macadamizing road	John Scott, Clerk, Co. Comrs.
Del.	Wilmington	4 p.m., May 31	Grading sts. and laying hard surf. pav't and concr. and brick gutters (not less than 50,000 sq. yds. pavement)	H. C. Taylor, Sec'y, Street & Sewer Dept.
Conn.	Stamford	June 1	5,500 cu. yds. excavation and 850 sq. yds. macadam	G. P. Rowell, Clerk.
O.	Galion	June 1	Paving and curbing streets	A. F. Unckrich, Dir. Pub. Ser.
D. C.	Washington	2 p.m., June 1	Repairing and resurfacing asph. pav't for two or five yrs.	Chief Clerk, Engineer's Dept., District Building.
Ky.	Greenville	June 1	Six miles macadam and dirt road, \$20,000 available	J. N. Fentress, Co. Clerk.
O.	Crestline	June 1	Paving with brick, estimated cost \$9,000	J. W. Atkinson, Engineer, Galion, O.
Ill.	Decatur	June 1	Paving several streets with brick	P. T. Hicks, City Engr.
Mich.	Escanaba	2 p.m., June 1	Grading and ditching 14 miles; grading and macadamizing five miles	Board of Road Comrs.
O.	Bowling Green	June 1	500 feet paving and concrete curb	C. L. Moyer, City Engineer.
O.	Sidney	June 1	Three miles stone road	C. A. Maurer, Engineer.
Wis.	Neenah	7 p.m., June 1	Laying hard surface pavement	H. S. Zemlock, Clerk, B. P. W.
Mont.	Great Falls	June 1	Gravel bitulithic on four streets, cost \$45,000	W. H. Harrison, City Clerk
Me.	Portland	noon, June 1	Paving with Hassam bico-mac	B. Bradbury, Jr., Comr. Public Works.
N. Y.	Port Jervis	June 5	Paving East Main Street	City Engineer.
O.	Cleveland	noon, June 5	Paving at Cleveland Heights	F. A. Pease Engineering Co., Marshall Building.
Ind.	Brownstown	2 p.m., June 5	Road construction	Albert Luedtke, Co. Auditor.
Ind.	Greencastle	2 p.m., June 5	19,500 ft. macadam and gravel roads	County Auditor.
Ind.	Portland	10 a.m., June 5	Macadamizing county road	John Bonifas, Co. Auditor.
Miss.	Gulfport	June 5	60 miles hard surface road construction	Harrison County Comrs.
N. Y.	Albany	1 p.m., June 5	Constructing and repairing highways in sev. counties	Edwin Duffey, State Highway Commissioner.
Wash.	Everett	June 5	Hard surfacing 1.1 miles of road	Mae Weatherbee, County Aud.
Wash.	Asotin	June 5	Highway work, cost \$10,000	V. G. Shellman, County Engr.
Ind.	Valparaiso	June 5	Constructing stone road	County Auditor.
Va.	Gates City	June 5	Improving roads, \$43,800 available	E. V. Martin, Engineer.
Ind.	Versailles	noon, June 5	Grading, paving and improving roads	J. T. Lochard, Co. Auditor.
Ind.	Hartford City	2 p.m., June 5	Constructing two roads	Co. Auditor.
Miss.	Columbus	June 5	20 miles of road; \$60,000 available	C. L. Wood, Engineer.
Ind.	Vernon	June 5	Constructing two miles stone road	G. J. Bernhart, Co. Auditor.
Ind.	Salem	1.30 p.m., June 5	Grading, paving and improving roads, four jobs	I. H. Rutherford, Co. Auditor.
O.	Columbus	noon, June 5	Grading and macadamizing road	John Scott, Clerk, Co. Comrs.
N. J.	North Arlington	8 p.m., June 5	Laying sidewalks	William Hoff, Boro Engineer.
Ind.	Martinsville	1.30 p.m., June 5	Grading, curbing and paving roads, two jobs	Sam Waterson, Co. Auditor.
Ind.	Rensselaer	1 p.m., June 5	Grading, curbing and paving roads	J. P. Hammond, Co. Auditor.
Ind.	Monticello	10 a.m., June 5	Grading, curbing and paving roads	A. G. Fisher, Co. Auditor.
Ind.	Crawfordsville	10 a.m., June 5	Grading, curbing and paving roads, two jobs	Dr. W. F. Batman, Co. Aud.
Ind.	Angola	4 p.m., June 5	Improving gravel road 3 miles long	F. C. Dewey, Co. Auditor.
Tenn.	Johnson City	7:30 p.m., June 5	13,652 sq. yds. asphalt, asphaltic concrete, concrete or Tarvia and 11,000 ft. curb and gutter	P. F. McDonald, City Engr.
Texas	Fort Worth	June 6	Paving one mile of streets	City Secretary.
Miss.	Tchula	June 6	Constructing sidewalks (\$4,000 available)	W. W. Gwin, Mayor.
Ind.	Rockville	11 a.m., June 6	Constructing gravel roads	County Auditor.
Ind.	Bloomfield	2 p.m., June 6	Constructing macadam road	G. E. Kidd, County Auditor.
Ind.	Boonville	10 a.m., June 6	Constructing rock roads	G. H. Bass, County Auditor.
Ind.	Knox	noon, June 6	Constructing township roads	C. Weninger, Co. Auditor.
Ind.	Kokomo	10 a.m., June 6	Macadam and asphaltic concrete roads	W. L. Benson, Co. Auditor.
Ind.	Lebanon	10 a.m., June 6	Constructing township road	C. Goodwin, Co. Auditor.
Ind.	Marion	10 a.m., June 6	Constructing gravel road	M. McRae, County Auditor.
Ind.	Shelbyville	10 a.m., June 6	3 miles crushed stone road	F. W. Fagel, Co. Auditor.
Ind.	Peru	noon, June 6	Improving with concrete	
N. Y.	Albany	1 p.m., June 6	Constructing and repairing state highways	Edwin Duffey, State Highway Commissioner.
Wash.	Sultan	June 7	7,500 sq. yds. paving	W. F. Leaville, City Clerk
Fla.	Palatka	June 7	Two miles of brick paving	County Comrs.
Ind.	Lafayette	10 a.m., June 7	Grading, curbing and paving roads	G. W. Baxter, Co. Aud.
Fla.	Tallahassee	June 7	33 miles sand-clay road and 91,000 cu. yds. excavation	J. C. Moore, Chairman, County Commissioners.
Okl.	Kiefer	noon, June 8	20 miles macadam road, including 60,000 cu. yds. excavation and embankment, cost \$94,000	P. J. Tuttle, Township Clerk
Kansas	Wichita	June 10	Paving several streets, cost \$25,000	B. C. Wells, City Engr.
O.	Zanesville	June 10	2,000 yds. brick pavement, cost \$4,200	C. R. Spencer, City Engr.
La.	Estherville	June 11	Grading 21 miles of road	C. P. Smith, Co. Engineer.
O.	Greenfield	June 15	Brick and macadam pavement, to cost \$25,000	E. M. Conner, Village Clerk.
O.	Zanesville	June 15	13,000 yds. brick pavement and 1,300 yds. concrete pavement, curbs and gutters	C. R. Spencer, City Engr.
Miss.	Charleston	June 21	Constructing 1 1/4 miles road	County Supervisors.
Utah	Salt Lake City	June 27	Concrete and asphalt paving	S. Q. Cannon, City Engr.
O.	Maumee	July 1	20,000 sq. yds. of paving	T. N. Dowling, City Clerk
La.	Terrebonne	noon, July 5	Constructing 11.7 miles sand-clay-gravel roads	T. B. Smith, Eng., Houma, La.
Miss.	Greenwood	July 10	100 to 140 miles hard surface road; \$600,000 available	County Supervisors.
Tex.	Caldwell	July 10	Sand clay roads; \$20,000 available	C. H. Maljowsky, Engineer.

SEWERAGE.

Ind.	Frankfort	May 20	Constructing storm sewer	R. H. Boynton, City Engineer.
O.	Linden Heights	May 20	Sewer construction, cost \$18,000	R. K. Schlafly, Engr., Columbus, O.
Alaska	Cordova	11 a.m., May 20	Sewer and water systems at Radio station	Bureau of Yards and Docks, Navy Department, Washington, D. C.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
N. J.	Lyndhurst	May 20	Constructing sewers; cost \$203,000	Bowe & Wessells, Engineers, Rutherford.
Pa.	Hazleton	May 20	2,600 ft. sewer, \$23,000 available	E. E. Youngman, City Engr.
Minn.	Duluth	11 a.m., May 20	Constructing sanitary sewer	J. A. Farrell, Comr. of Public Works.
Wis.	Beloit	2 p.m., May 20	11,000 ft. 8-in. sewer with manholes, etc.	City Clerk.
Ore.	Myrtle Point	7:30 p.m., May 22	22,400 ft. 6 and 8-in. sewer	City Clerk.
Mich.	Bay City	9 a.m., May 22	Constructing 8 to 12-in. tile sewers	F. P. S. Kelton, Chairman Bd. of Public Works.
Minn.	Spooner	May 22	Constructing sewer system and disposal works	A. M. Robertson, Vil. Clerk
Ind.	Kokomo	May 22	Constructing 12-in. tile sewer	Ben Havens, City Clerk
Mich.	Highland Park	May 22	Constructing sewers	R. M. Ford, Village Clerk
N. J.	Montclair	May 22	Constructing storm sewers	E. S. Clossen, Town Engr.
N. J.	Ridgefield Park	May 23	Constructing sewers and disposal plant	Lederle & Provost, Engrs., 39 W. 38th St., N. Y. City
N. J.	Newark	2 p.m., May 23	Sec. 4 of outfall sewer works for Passaic valley sewer	Passaic Val. Sewerage Com'r.
Ill.	Dixon	10 a.m., May 23	Sewage treatment plant at Epileptic Colony	W. F. Shields, Engr., Hartford Bldg., Chicago, Ill.
Mich.	Davison	9 a.m., May 23	Tile drainage ditches	A. H. Reid, Co. Drain. Com'r.
Ind.	Michigan City	May 23	Two 10-inch tile sewers	Board of Public Works.
N. Y.	Binghamton	May 24	Constructing section 1 of main intercepting sewer	W. Earl Weller, City Engr.
Ohio	Tiffin	Noon, May 24	Constructing 1,762 ft. sewers	Wm. Heller, dir. Pub. Serv.
N. C.	Durham	2 p.m., May 25	10½ miles 10 and 24-in. sewers	H. Keuffner, City Engineer.
Wis.	Milwaukee	May 25	Inverted syphon under river and 11,000 ft. 30 to 72-in. sewers	T. C. Hatton, Chief Engr., Sewerage Commission
N. Y.	Hudson	May 25	600 ft. 12-in. tile sewer	Henry James, City Clerk
O.	Youngstown	noon, May 25	Constructing sewer	City Engineer.
N. Y.	Brooklyn	11 a.m., May 26	Repairing sewer	Bureau of Sewers.
O.	Mount Vernon	noon, May 27	Sewers in several streets	C. G. Snow, Dir. Pub. Service.
N. J.	Westfield	May 27	Constructing relief sewer	Chas. Clarke, Town Clerk
Neb.	Ralston	noon, May 29	600 ft. 10-in. sewer and 2 manholes	Towl Engineering Co., Omaha.
Me.	Biddeford	May 29	Reinforced concrete egg-shaped sewer	W. C. Bigelow, Engr., Smith Building
Minn.	Wabasha	May 29	Extending sewer system	J. F. Dreuer, Engineer.
Ill.	Rock Island	May 30	48-in. storm drain	William McConochie, Mayor.
N. J.	Newark	2 p.m., May 31	Section of 54 and 64-in. tunnel and open cut sewer	Passaic Val. Sewage Com.
N. C.	Raleigh	11 a.m., May 31	Sewer system at National Cemetery	Depot Quartermaster, U. S. A., Washington, D. C.
Wis.	Monticello	7:30 p.m., June 1	Constructing sewers and disposal plant (Imhoff)	W. G. Krichoffer, Engineer, Madison, Wis.
Ill.	Marshall	June 1	Nine blocks combined sanitary and storm water sewers	J. W. Lewis, Chairman Bd. of Local Impts.
Tenn.	Johnson City	7:30 p.m., June 6	6,450 ft. 6 to 12-in. sewers and 9 manholes	P. F. McDonald, City Engr.
Miss.	Tchula	June 6	Constructing sewer system	W. W. Gwin, Mayor.
Fla.	Tallahassee	10 a.m., June 8	Constructing drains	J. W. Jones, Co. Engr.
O.	Zanesville	June 15	500 feet 5 to 15-inch sewer	C. R. Spencer, City Engineer.
Arizona	Oatman	June 15	Water and sewer systems, estimated cost \$250,000	C. L. Mayhew, Sec. Mohave-Oatman Water Co.
O.	Xenia	June 15	Constructing storm sewers, cost \$35,000	J. P. Shumaker, City Engineer.
Minn.	Benson	July 1	48 miles drainage ditch; 250 miles 6 to 30-in. tile	F. B. Gardner, Engineer.
Ill.	Salem	July 15	Sewer system and disposal plant, cost \$50,000	City Clerk.
WATER SUPPLY				
Alaska	Cordova	May 20	Water and sewer systems at Radio Station	Bureau of Yards and Docks Navy Department, Washington, D. C.
Col.	Pueblo	May 20	Excavating 100,000 cu. yds., constructing earth dam and raising reservoir	A. A. Welland, Engineer, Thatcher Bldg.
Que.	Montreal	May 20	Pumping station and 1,000,000 gal. pump; estimated cost, \$1,500,000	R. S. and W. S. Lee, New Birks Bldg.
Minn.	Chisholm	1 p.m., May 20	Two centrifugal electric-driven pumps and motors	C. J. Sullivan, Supt. of W.W.
Neb.	Havelock	8 p.m., May 20	Extending water main (1,140 ft.)	A. J. Blount, City Clerk.
Wis.	Beloit	2 p.m., May 20	230 sewer services, 350 water services and 400 gas services	City Clerk.
O.	Wooster	noon, May 22	Laying 4,375 ft. 12 and 16-in. c. l. pipe and taking up 2,200 ft. 4 and 6-in.	Max Bloomberg, Dir. Pub. S.
Kan.	Wakeeney	May 22	Water works extension and pumps	J. H. Heckman, City Clerk
Colo.	Grand Junction	May 23	Constructing 3,950 ft. 60-inch wood stave pipe	U. S. Reclamation Service.
Wash.	Wenatchee	6 p.m., May 23	Making and laying 5,470 ft. 63-in. reinforced conc. pipe	W. P. Knapp, Sec. Drain. Dis.
O.	Columbus	noon, May 23	Installing steel lining for soda tank at water purification plant	Jerry O'Shaughnessy, Supt. of Waterworks.
Wash.	Wenatchie	May 23	5,470 ft. 53-in. reinforced concrete pipe and 100 tons 5-in. 2-piece steel bands with shoes and nuts for 60-in. wood stave pipe	W. T. Knapp, Secy. Wenatchie Reclamation District
O.	Cincinnati	noon, May 24	Two 6,000,000-gallon and one 4,000,000-gallon pumping engines, eight boilers, two engines, two generators, etc.	Ernst Von Bargen, City Pur. Agent
N. J.	Newark	3:30 p.m., May 25	Furnishing meter testing apparatus	M. R. Sherrerd, Chief Engr
O.	Cleveland	noon, May 25	Automatic oiling and filter system for pumping station	Deputy Com'r of Water.
Mont.	St. Ignatius	2 p.m., May 25	220,000 cu. yds. of excavation; making and laying 6,230 ft. concrete pipe	U. S. Reclamation Service.
D. C.	Washington	May 26	Wrought iron and steel pipe and other supplies for Panama Canal	Gen. Purchasing Officer, Panama Canal.
N. Y.	Perry	May 27	Constructing slow sand filter and reservoir	O. N. Bolton, Village Clerk
Kan.	Oskaloosa	2 p.m., May 29	Waterworks system, \$32,500 available	W. O. Werswick, City Clerk
Minn.	Morris	May 31	Furnishing 7,300 tons 4 to 10-in. water pipe and 4 tons specials	S. S. Siverts, Jr., City Mgr.
Wash.	Aberdeen	May 31	Constructing water system, cost \$400,000	L. D. Kelsey, City Engr.
N. C.	Raleigh	11 a.m., May 31	Water system at National Cemetery	Depot Quartermaster, U. S. A., Washington, D. C.
W. Va.	Madison	June 1	Constructing water works system	H. W. D. Mullens, Mayor.
Col.	Castle Rock	7:30 p.m., June 1	Water system, \$40,000 available	G. H. Sethman, Engineer, Equitable Bldg., Denver.
Del.	Wilmington	2 p.m., June 2	7½ million-gal. reservoir	E. M. Hoopes, Jr., Chief Engineer, Bd. of Water Com'rs.
Tex.	El Paso	June 3	Electrically operated pumping equipment	Depot Quartermaster, Ft. Bliss
Wash.	Everett	June 5	28 miles of flow line, 2 river crossings, rock-fill dam and other improvements; estimated cost \$600,000	Burns & McDonnell, Engr's, Interstate Bldg., Kan. City, Mo.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ind., Hartford City	2 p.m., June	5..	Water system at County Infirmary.....	J. L. McGeath, Co. Auditor.
Minn., St. Paul	10:30 a.m., June	5..	Furnishing c. i. pipe, valves, Venturi meter, and erecting reservoir complete	Aug. Hohenstein, Pur. Agent.
Miss., Tchula	June	6..	Constructing wells, mains, water tower or tanks.....	W. W. Gwin, Mayor.
O., Cleveland	noon, June	5..	Laying 6-in. water mains at Cleveland Heights.....	F. A. Pease Engineering Co., Marshall Building.
Tex., Port Arthur	2 p.m., June	15..	Equipment for pumping plant	J. F. Coleman, Engineer, Hi-bernia Bldg., New Orleans, La.
Arizona, Oatman	June	15..	Installing water and sewer systems, cost \$250,000.....	C. L. Mayhew, Sec. Mohave-Oatman Water Company.
MISCELLANEOUS.				
N. D., Leith	2 p.m., May	20..	Constructing 30 miles of telephone line	J. L. Cahill.
N. M., Silver City	1:30 p.m., May	20..	Furnishing rock crusher.....	E. B. Venable, Co. Clk.
Fla., Tallahassee	10 a.m., May	20..	Constructing and improving canals.....	F. C. Elliott, Chief Drainage Engr.
D. C., Washington	May	20..	Two ship-building cranes at Mare Island Navy Yard....	Bureau of Yards and Docks, Navy Dept.
Ill., Maple Park	2 p.m., May	20..	200,000 cu. yds. of excavation on drainage work.....	Hay & Lowman, Engineers, Sycamore, Ill.
O., Cincinnati	May	22..	4,200 bbls. portland cement.....	U. S. Engineer Office.
Wis., Racine	2 p.m., May	22..	Several miles of drainage ditches.....	P. J. Hurtgen, Engineer, Burlington, Wis.
Ore., Portland	2 p.m., May	22..	Two-wheel tractor	J. R. Wood, City Pur. Agent.
Wyo., Ft. Laramie	May	22..	Constructing two tunnels and lining canal with concrete.	U. S. Reclamation Service.
N. J., New Brunswick	3 p.m., May	22..	One 6-ton auto truck	Edward Burt, Co. Collector.
Ind., Muncie	11 a.m., May	22..	Constructing drainage ditch	Wm. Ritchie, Supt. of Con.
Pa., Northampton	6 p.m., May	22..	Collecting and removing garbage for five months.....	J. W. Smith, Secy.
O., Cincinnati	noon, May	22..	8 to 16-h. p. oil tractor	Ernst Von Bargen, City Pur. Agent.
O., Cincinnati	noon, May	22..	Constructing fire engine house.....	W. J. Friedlander, Director Public Safety.
N. Y., Albany	May	23..	Constructing sub-structure, super-structure and approaches to bridge for two bridges over Hudson and Mohawk Rivers	W. W. Wotherspoon, State Supt. Pub. Wks.
Cal., Sacramento	m., May	23..	Constructing weir, cost \$460,000.....	City Engineer.
Wyo., Fort Laramie	May	25..	8 1/2 miles canal, requiring 793,000 cu. yds. excavation....	U. S. Reclamation Service.
N. Y., New York	May	25..	Subway construction.....	Public Service Commission.
Col., Denver	10 a.m., May	25..	115,000 bbls. Portland cement	U. S. Reclamation Serv., Federal Bldg.
N. J., Elizabeth	May	25..	Collecting and removing ashes and garb. for three yrs....	City Clerk.
Ind., Shelbyville	May	25..	Constructing drainage ditch	W. T. Ensminger, Drainage Comr.
Va., Clintwood	June	26..	Two steel bridges.....	W. E. French, Co. Engineer.
N. Y., New York	11 a.m., May	25..	Supplies for vacation playground	Patrick Jones, Supt. School Supplies.
Man., Virden	6 p.m., May	26..	Concrete pipes in several roads.....	Wm. Whiteford, Sec.-Treas.
La., Bloomfield	noon, May	29..	Drainage ditch, estimated cost \$41,490.....	I. A. Patterson, Co. Auditor.
Neb., Fremont	May	31..	Constructing drainage ditch	County Clerk.
La., New Orleans	3 p.m., May	31..	Constructing levees	Chief Engr. Orleans Levee Bd.
La., Oskaloosa	June	1..	Constructing drainage ditch	R. U. Rowland, County Aud.
N. Y., Tompkinsville	June	1..	Cotton and rubber fire hose and other supplies.....	Lighthouse Inspector
Minn., Caledonia	2 p.m., June	1..	Constructing drainage ditches and culverts.....	E. N. Newhouse, Co. Aud.
D. C., Washington	June	3..	One-ton bucket dredge.....	Bureau of Yards and Docks, Navy Dept.
Ind., Monticello	10 a.m., June	6..	Bridges over drainage ditches.....	A. G. Fisher, Co. Auditor.
Ill., Belleville	June	15..	Improving creek, cost \$79,600.....	W. C. Wolf, City Engineer.
Utah, Provo	June	15..	Constructing canal	U. S. Reclamation Service.

STREETS AND ROADS

Miami, Ariz.—Movement is on foot for oiling streets.

Fresno, Cal.—Report of Fresno county highway commission calling for \$3,600,000 bond election for construction of system of 441 miles of permanent roads in Fresno county has been filed with supervisors. No date has been set for election. One of the mountain roads to be improved is road to General Grant National park.

Grass Valley, Cal.—Nevada County Promotion Committee has passed resolution in favor of \$15,000,000 bond issue for completion of system of State highways.

Los Angeles, Cal.—Ordinances have been adopted for improvement of several streets.

Sacramento, Cal.—Movement for completion of Alpine State highway, in Amador County, by appropriation of \$15,000 from State Highway fund, has been started by committee of Amador County citizens.

Sacramento, Cal.—Supervisors of Siskiyou County decided to construct proposed Yreka-Fort Jones highway over Forest House Mountain and will make provision in next tax levy for raising of \$60,000 to complete the work.

Sacramento, Cal.—Yolo County Board of Supervisors instructed Supervisor F. E. Edson of Knights Landing to obtain rights of way for a proposed highway from Woodland north to Colusa County line.

Sacramento, Cal.—National Forest Service having agreed to appropriate an equal amount, the Siskiyou County Supervisors voted to expend \$5,000 toward building highway from Forks to the Salmon to Somes Bar in Siskiyou County.

San Francisco, Cal.—Board has decided

to improve Forty-eighth Ave between Lincoln way and Kirkham St. at an estimated cost of \$21,955, and 37th Ave. between Irving and Judah Sts., the cost being estimated at \$3,500.

Longmont, Colo.—City will spend more than \$38,000 for concrete paving this season. Paving District No. 2, which has been accepted by city council and is now being surveyed and estimated by city engineer, includes 14 500-ft. blocks, or a total of 7,000 feet. Two blocks will be 65 feet wide, three will be 45 feet, two 40, and the remainder 30. E. S. Bice is City Engr.

Washington, D. C.—American consular officer in West Africa writes that a merchant in his district desires to receive prices c. i. f. destination on good grades of American cement. Correspondence may be in English. No. 21148).

Washington, D. C.—Following items have been included in District bill: Grading and improving of Portland St., \$10,500; Livingston road, \$9,000; Nicholas Ave., \$11,800. In this connection request will be sent to Representative Johnson, chairman of the House district committee, asking that an item of \$10,300 be included for improvement of Alabama Ave. from Nicholas Ave. to 10th place, and also \$2,800 for Raleigh place from Nicholas Ave. to 7th St.

Bartow, Fla.—Polk county awarded contracts for 220 miles of highway, 20 concrete steel bridges and 90 reinforced concrete culverts; divided into five contracts and conditional upon voting \$1,500,000 bonds at election on June 1.

Bonifay, Fla.—Bond issues of \$50,000 and \$30,000 have been voted for good roads in this county.

Cocoa, Fla.—Cocoa-Rockledge Indian River road district voted in favor of bond issue of \$300,000 to hard-surface

and widen Dixie highway through this road district.

West Palm Beach, Fla.—County Engineer C. H. Ruggles has submitted report to county commissioners in which he outlines two possible routes for proposed trans-Everglades road. Of the two alternative routes he recommends what is distinguished as "lake shore" route. He estimated that this road could be hard surfaced, nine feet wide, at cost of \$25,870.16. It could be extended to width of nine feet at a total cost of \$36,500. Alternative route which Mr. Ruggles did recommend so favorably would follow what is known as Fort Drum or old military trail.

Americus, Ga.—Bond issue of \$30,000 for street improvements recently voted, sold to W. M. Davis Co., Macon, for \$31,035.

Atlanta, Ga.—Mayor Woodward has authorized paving of West Peachtree St.

Spirit Lake, Ida.—Election will be held May 26 to vote on formation of Panhandle highway district.

Chester, Ill.—Streets throughout entire city will be oiled and quotations are desired at once. Address Gene Beare, City Clerk.

Chicago, Ill.—Several contracts have been awarded for constructing concrete curbs, grading and paving with vitrified brick.

Galesburg, Ill.—Knox County board has approved estimate of state highway commission for improvement of Route 1 at cost of \$18,536.

Springfield, Ill.—Board has passed resolution calling for paving of Peoria road.

Clinton, Ind.—Three road improvements have been ordered for Clinton township. One road is to be paved with brick and another with brick and concrete. Third pavement will be of con-

crete, 16 ft. wide, westward from West Clinton.

Fort Wayne, Ind.—Board will confirm resolutions for opening of Boerger Ave. from Pluqua Ave. to alley west; for vacating Canal St. from Clay to Monroe Sts., and opening of Meridian St. from Huffman St. to alley north.

Fort Wayne, Ind.—Board of works will order an 18-ft. concrete pavement on Hanna St. from Rudisill boulevard to McKinney Ave. Property owners will pay intersection costs.

Fort Wayne, Ind.—Council committee will confer with board of works, board of county commissioners and park commission with a view to arriving at some definite plans for putting through George Kessler scheme of boulevards.

Hartford City, Ind.—Board has been asked to change Cherry road specifications from glutrin binder to asphalt, on part of road in city to south end of brick on Walnut St., and to brick remainder. Viewers will meet May 13 to change specifications.

Indianapolis, Ind.—Judge Linn D. Hay, of superior court, Room 2, has ruled that city administration may proceed in plan to widen Meridian St. between 16th St. and Fall creek over remonstrance of property owners. Decision was made on appeal by remonstrators. Judge Hay's decision is final, there being no provision for an appeal of such cases.

Indianapolis, Ind.—Bids will be received May 15 by Edward G. Sourbler, treasurer of Marion County, for road bonds amounting to \$483,850. Bonds will be sold to pay for 15 concrete roads, which have been ordered and contracted for by Marion County Commissioners.

Kokomo, Ind.—All bids for Indiana Ave. have been rejected by board of works. No asphalt bids had been filed and it was stated that property owners wished asphalt. Job will be readvertised. New estimate was ordered on asphalt.

Mishawaka, Ind.—Engineer Charles Cole has been authorized to obtain prices for street signs.

Muncie, Ind.—Resolutions for improvement of Mulberry St. from Charles St. to Big Four railroad and Charles St. from Mulberry to High Sts. have been finally approved and bids will be advertised for soon.

Muncie, Ind.—City Engineer D. F. Deardorff has submitted estimates on some of the proposed improvements in the city as follows: Second St. from Macedonia Ave. to Walnut St., \$11,465.96. Macedonia Ave. sidewalk from Ninth St. to Ohmer Ave., \$510.25. Howard St. sidewalk, north side from Proud St. to first alley east, \$81. Adams St. from High to Walnut St., \$2,145. Sixth St. sewer from Monroe to Plum Sts., \$8.35. Howard St. from High to Madison Sts., \$11,878.37. Alley between Vine and Plum Sts. from Wysor to Gilbert Sts., \$994.50. Alley between Vine and Plum Sts. from Gilbert to within 125 ft. of Washington St., \$532. Alley between Adams and Jackson Sts. from Vine to Plum St., \$1,208.

Richmond, Ind.—Plans are being considered for oiling macadam roads at estimated cost of \$1,500, including purchase of oiling machine.

Seymour, Ind.—Petitions asking improvement of more than 15 miles of highways with concrete or brick are pending before County Commissioners.

Britt, Ind.—Town contemplates construction of about 59,000 yds. of paving and about 30,000 lin. ft. of combined curb and gutter or curb. Contracts will probably be let about June 29th. Theo. S. De Lay is Consulting Engineer.

Spencer, Ind.—City is in the market for hand carts, pans, brooms, etc., for street cleaning. Catalogues may be sent to J. L. Frank, chairman of street and alley committee.

Elkton, Ky.—Citizens will vote June 10 on \$19,000 bond issue for good roads.

Georgetown, Ky.—The surveys, plans and specifications under which an expenditure of \$100,000 on the inter-county seat roads in Scott County will be made, are about completed, and it is expected that contracts will be let shortly.

Lexington, Ky.—J. F. Voschell government road expert, recommends that roads be paved to width of 15 ft. instead of 12 ft.

Louisville, Ky.—Campaign is being planned for improvement of highways.

Louisville, Ky.—Several ordinances have been approved calling for improvement of sidewalks on several streets.

Morehead, Ky.—Rowan county votes June 24 on \$60,000 road construction bonds.

Newport, Ky.—County Road Engineer Ernest Ratcliffe has been instructed to prepare plans and specifications and to receive bids for reconstruction of Alexandria and Flag Springs pike for distance of eleven and one-half miles.

Shelbyville, Ky.—Recommendation has been adopted by council for macadamizing Adair Ave. in Catalpa Court.

Shepherdsville, Ky.—Bullitt county recently purchased \$6,000 worth of machinery to be used in bettering road conditions.

Walton, Ky.—Citizens of Boone County have voted in favor of \$200,000 bond issue for good roads.

Whitesburg, Ky.—Bond issue for good roads was defeated at recent election, but another road bond election will be called for Letcher county as soon as law will permit.

Wickliffe, Ky.—Ballard county Fiscal Court has adopted plans and specifications for fifty-five miles of road as surveyed and estimated by Prof. D. V. Terrell and his class of engineers from State University. They surveyed and made estimates on 100 miles. Court adopted 100 miles, but will work first 55 miles under State aid. Everything is now ready to let contract, which will be done as soon as law will permit.

Williamstown, Ky.—Citizens voted in favor of issuing \$5,000 bonds for reconstruction of Main St. with asphalt, about a mile in length.

Colfax, La.—Grant Parish Police Jury has authorized Dr. W. R. Buffington, juror from Ward Five, to execute contract for construction of Georgetown and Packson model highway for 12 miles in road district 5, upon such terms and conditions as he may deem proper.

Jennings, La.—A \$5,000,000 bond issue for construction of public highways in Jefferson Davis parish was sold to Bulger, Moss & Willman, bond brokers of Chicago at par plus \$1,015, and furnishing bonds. Sale was made pending the result of bond election, which is to be held on May 29.

Mansfield, La.—De Soto parish voted \$250,000 bonds for building highways.

New Orleans, La.—Bill providing for issuance of \$25,000,000 in good road bonds is to be introduced in next Louisiana general assembly, according to carefully prepared plans which have been announced in New Orleans.

Bangor, Me.—Order has been introduced authorizing bids for building of bituminous road on Main St. from Union St. to town line, cost not to exceed \$29,000. Bids will be reported to city council for final action.

Fall River, Mass.—Aldermanic committee on highways has decided to approve Mayor Kay's plan for dividing macadam work between street department and a private concern. Committee also approved purchase of an asphalt mixer to enable Superintendent Manning's force to handle macadam work. Provision has been made for block pavement and concrete surface to be continued under system in vogue here for past few years whereby work is done by a Boston concern. Nine streets were designated for this work, amount appropriated aggregating about \$36,000.

Lowell, Mass.—See "Miscellaneous."

Milford, Mass.—Town meeting will be held May 16th to vote on following appropriations: \$3,000 for rebuilding Congress St.; \$1,000 for resurfacing Grant St.

Monroe, Mich.—Work on 14-mile section of Detroit-Toledo highway between Rockward and Monroe will be begun at once. Estimated cost, \$225,000.

Pittsfield, Mass.—Ordinances will be introduced shortly asking for appropriation of \$9,800 for paving Melville St. and for \$1,200 additional for surface drain on street.

Pittsfield, Mass.—Board has decided to construct sidewalks on 23 streets.

Pittsfield, Mass.—Although \$53,000 order to pave South St. from Buel St. to South Mountain road was killed by Common Council on third reading, it is expected that measure will soon be adopted by both boards.

Springfield, Mass.—Petitions have been received asking for widening and relocating of Main and Locust Sts.

Pontiac, Mich.—Sealed bids will be received by County of Oakland, Mich., at office of the County Clerk, at Pontiac, Mich., until May 22, 1916, for purchase of an issue of \$250,000 of Oakland County highway bonds dated May 22, 1916, and bearing interest at 4½ per

cent per annum, payable semi-annually on the 15th day of March and the 15th day of September of each year. Floyd B. Babcock is County Clerk.

Saginaw, Mich.—Reported that bids for paving eight streets will be rejected on account of being too high.

Sault Ste. Marie, Mich.—Council has voted following appropriations: Streets, \$50,000; fire department, \$15,000; sewers, \$15,000; bridges, \$15,000; water works, \$40,000.

Sault Ste. Marie, Mich.—Council has decided to order paving on Biggings Ave.

Sault Ste. Marie, Mich.—Work on building state trunk roads in county is now going on and additional activity will begin in a few days.

Duluth, Minn.—Appropriations have been authorized by commissioners from county special road fund for improvements on roads in following districts: First district, \$9,100, of which amount \$2,000 will be used for improving that portion of the Howard-Gnesen road within the city limits. Fourth district, \$14,000; Fifth district, \$5,800; Sixth district, \$5,316.29.

Eveleth, Minn.—Plans are being considered for construction of new road between this city and Virginia.

St. Paul, Minn.—Ordinances have been passed calling for construction of sidewalks.

Carthage, Miss.—Supervisors have been petitioned for bond issue of \$10,000 to pike Tusclometa swamp in Leake County.

Columbia, Miss.—Board of Supervisors has ordered a notice published that it was intention of board at June meeting to issue bonds to amount of \$200,000. Bonds will be used for the construction of one road 30 miles long, reaching from northern boundary to southern boundary.

Greenville, Miss.—Washington county votes June 14 on \$950,000 bonds for road construction, including 150 miles of highway.

Gulfport, Miss.—There was no election on proposed bond issue of \$85,000 May 9, because board of supervisors on petition of voters of county, recalled election. The issuing of these bonds of \$85,000 was for construction of roadway and bridge between Pascagoula and Gautier along line of the Louisville and Nashville R. R. Recalling of election is due to a compromise last week by advocates of issue and its opponents. Original scheme and one opposed, was that county should construct the roadway and bridge. Compromise is for beats 3 and 4, in which cities of Pascagoula and Ocean Springs are situated, to issue bonds of \$20,000 each for highway, on condition that county build steel bridge over West Pascagoula river and ferry to be used at Pascagoula on East Pascagoula river, bridge and ferry to cost not exceeding sum of \$50,000.

Gulfport, Miss.—Board of Supervisors has placed itself on record as favoring construction of Jefferson Davis Highway through Harrison County and will so proceed, providing counties to north through which highway is to run will also build.

Hazlehurst, Miss.—Board of supervisors of Copiah county ordered an additional bond issue of \$25,000 for graveling of public roads in District No. 5.

Marks, Miss.—Supervisors issued notice of sale of \$150,000 bonds for Beat Four for building of good roads. Board also gave notice of issuance of \$25,000 bonds to take up current expenses of this county for 1916.

Greenville, Mo.—Wayne county voted \$200,000 bonds to build roads and bridges.

Kansas City, Mo.—Board of Public Works has adopted resolution to pave Walnut St. with creosoted wood blocks, from Twelfth St. to Nineteenth St.

Tusculum, Mo.—Miller county voted \$30,000 bonds for building roads.

Billings, Mont.—Extensive improvements are contemplated in Broadwater and Yellowstone subdivisions.

Grand Island, Neb.—Recommendation has been adopted calling for 50-ft. paving on Pine St.

Grand Island, Neb.—Ordinance has been approved creating paving district and providing for paving of same. H. E. Clifford is City Clerk.

Colts Neck, N. J.—Proposition to construct new road to Farmingdale at estimated cost of \$17,500 is being considered.

Elizabeth, N. J.—Ordinance has been passed on final reading appropriating \$297,469.75 to permit board of works to carry out its repaving program, providing for improvement of Elizabeth Ave.

and many other streets. Ordinances adopted on first and second reading, appropriating \$24,000 for repaving of Cross Ave., and \$8,500 for equipment for playground at Second Ave. and South 7th St.

May's Landing, N. J.—Board of Freeholders has authorized preparation of plans for paving, 16 ft. wide, county road from Absecon to Camden county line above Hammonton. Estimated cost of the improvement will be \$400,000 and effort will be made to complete work by fall.

Newark, N. J.—Rescinding resolutions awarding contract for paving of two streets in Greylock section of Belleville with asphalt block. Town Commission has ordered readvertising for bids for laying of either asphalt block or national paving.

New Brunswick, N. J.—Further plans have been made by board of freeholders for continuation of improvement of Cranbury Turnpike. At recent meeting resolutions were adopted carrying work up to Dayton from this city. Resolutions were adopted providing for improvement of section from Dayton to Mercer county line at Hightstown. Freeholder Andrew Ely will take resolutions to Trenton at once for approval of state road commissioner so as to get work done this summer if possible.

New Brunswick, N. J.—Three new bond issues have been ordered to take care of expenses incurred for rebuilding and repairing roads and bridges.

Newark, N. J.—Finance committee has recommended bond issue of \$27,000 for improvements to county roads and culverts.

Passaic, N. J.—\$99,000 road bond issue was sold to Citizens' Trust Company for \$102,178, premium being \$2,178.

Somerville, N. J.—Board of freeholders has appropriated \$4,000 for building five roads.

Trenton, N. J.—Discussion of work of construction on extension of Ocean Blvd. from Keyport to Atlantic Highlands was held recently by Governor Fielder, State Road Commissioner Edward A. Stevens and State Treasurer William T. Read of the Highway Commission. It was finally decided to make complete survey between two points which is part of highway system.

Albion, N. Y.—Albion taxpayers have approved proposition to spend \$100,000 on paving of Main St. its entire length and part of Bank St. State will allow \$23,000 for its share of work, making total expenditure \$123,000.

Binghamton, N. Y.—Movement is on foot among property owners in residence districts to improve number of side streets with pavements this summer and preference is being given concrete pavement.

Brooklyn, N. Y.—Resolution has been adopted indorsing City Plan Committee's report on widening of Kings Highway and requesting Borough President Pounds to do all in his power to have Board of Estimate place widened area on city map.

Buffalo, N. Y.—It is expected that a vote will be taken by councilmen shortly on notice of determination to take by condemnation proceedings lands required for extension of Ganson St. from its terminus south of Peck Slip to islands in Buffalo River near foot of Main St.

Corning, N. Y.—Nearly 15 miles of improved county highway has been authorized constructed this summer by board of supervisors.

Dunkirk, N. Y.—Arrangements are being made by Common Council for paving of approximately 35,000 sq. yds. of streets this summer. Specifications are ready for distribution to prospective bidders and bids will be opened at next Common Council meeting.

Gouverneur, N. Y.—Board has decided to curb and macadamize Barnes St. at cost of about \$2,000.

Lockport, N. Y.—Committee will be appointed shortly to discuss plans for improvement of Gooding St.

Lockport, N. Y.—Delegation of 20 from Pendleton has urged board to get behind their efforts to have Lockport-Pendleton road improved as county highway. Another delegation from Newfane and Somerset asked support of Lockport in getting state to improve Lake road from Olcott to Orleans county line and along lake shore. Board agreed to take matter up at once with Senator Thompson and have him get the state highway department active.

Olean, N. Y.—Common Council awarded \$72,600 worth of street improvement

bonds bearing 4½ per cent. interest to A. B. Leach & Co., of New York, on their bid of \$1,197 above par.

Lyons, N. Y.—See "Miscellaneous."

Oneida, N. Y.—Plans are being discussed for improvement of section of Williams St. Plans call for .91 of a mile of bituminous waterbound macadam to be constructed on 26-ft. roadbed with 16-ft. surface, which is to be surfaced with fine crushed stone and oil dressing at total cost of about \$13,000.

Rochester, N. Y.—Council considering plans for extension of several streets.

Rochester, N. Y.—Following final ordinances for improvements have been adopted: North Water St., additional lighting, estimated cost, \$408; Granger Pl., extension, \$5,000; Spencer St., pavement, \$4,800; Delmar St., pavement, \$8,800; Dove St., pavement, \$5,100; Clay Ave., asphalt pavement, \$28,000; Waverly Pl., pavement, \$4,200; Oxford St., care and embellishment, \$660; Luzerne St., pavement, \$5,400; Alford St., grading, walks and sewer, \$6,600; Hazelwood Ter., pavement, 2,000; Ackerman St., pavement, \$12,500; Bradburn St., tree planting, \$104; Walnut St., sewer, \$556; Blossom Rd., sanitary and storm-water sewer, \$2,800; Woodlawn Park, pavement, \$7,000; Hoster St., sewer and grading, \$3,500; Dewitt St., extension, \$900; Randolph Ave., extension, \$500; Oneida St., extension, \$500; Grafton St., extension, \$500; Midland Ave., opening, \$500; Portland Ave., pavement; Atlantic Ave., walks, \$9,000; Beach Ave., extension, \$20,000. Action on ordinances for the extension of Northland Ave., \$5,000; Urquhart St., pavement, \$14,000, and Norton St. pavement, was postponed until the next regular meeting.

Rome, N. Y.—City engineer has prepared plans and specifications for paving several streets.

Saranac Lake, N. Y.—Board of trustees has been petitioned for macadam road and drainage system on Lake St. at estimated cost of \$5,000 and \$2,000, respectively. No definite action has been taken.

Springville, N. Y.—Town will vote May 16 on bond issue of \$5,680 for paving Waverly St.

Utica, N. Y.—Committee will appear before supervisors to ask for improvement of Schuyler Street road in town of Marcy.

Utica, N. Y.—City Engineer Plunkett has prepared plans and specifications for improvement of several streets which have been approved by Board of Public Works and will be presented to Common Council at once.

Utica, N. Y.—Board of Supervisors has been petitioned by several towns for county road improvements. Action will be taken at special session May 23.

Yonkers, N. Y.—Ordinances have been adopted authorizing paving to be done on North Broadway and sidewalks to be constructed on Bailey Ave.

Walden, N. Y.—Street committee has decided to oil streets this summer.

Dobson, N. C.—Surry county, Franklin township, votes May 30 on \$30,000 bonds to construct roads.

Kinston, N. C.—Seven more blocks of asphalt have been authorized by City Council.

Shelby, N. C.—City will issue \$40,000 bonds for street improvements, etc.

Wilmington, N. C.—Plans are being considered for new road about one mile in length from Scott's Hill Highway to Winter Park Section.

Wilmington, N. C.—County Auditor has been authorized to borrow \$10,000 for six months at 4 per cent to be used for road fund. Petition has been presented to board asking that spur road of about 200 yards in length be extended to proposed highway between Scott's Hill Rd. and Wrightsville turnpike at Winter Park in order to connect new road with Audubon Ave.

Bismarck, N. D.—City commission by unanimous vote of all members present went on record in favor of paving streets upon which municipal property abuts.

Bismarck, N. D.—All big property owners are in favor of proposition to pave city extensively.

Cleveland, O.—Representatives of civic organizations have indorsed proposed bond issues of \$3,500,000 and \$1,500,000 for street improvements.

Columbus, O.—Sealed proposals will be received at office of board of county commissioners of Franklin Co., Columbus, O., until May 26, for purchase of Franklin County road improvement bonds in sum of \$29,000. John Scott is Clerk of Board.

Coshocton, O.—Council considering or-

dinance calling for bond issue for paving East Chestnut St.

Fremont, O.—County Commissioners contemplate improvement of Fremont-Bowling Green road at estimated cost of \$93,000.

Marietta, O.—Resolution will be introduced calling for cement concrete sidewalks on Second St.

Massillon, O.—Plans are being made for curbing, guttering and constructing sidewalks on several streets.

Niles, O.—Ordinance has been approved calling for bond issue of \$7,800 for paying part of the cost of paving Second St.

Middletown, O.—City will receive proposals until May 18 for two road bond issues of \$9,000 and \$14,000 respectively. Louis T. Nein is City Auditor.

Oklahoma City, Okla.—Oklahoma county issued \$50,000 bonds for road construction.

Perrysburg, O.—Repaving of Front St. in Perrysburg is practically assured. It will begin at West Boundary St., near river bridge between Perrysburg and Maumee, and extend to East Boundary St., where it will connect with new 19-ft. cement highway being constructed by state. Work will begin soon on boulevards through the Ft. Meigs park grounds. Zeller brothers, of Maumee, have contract. Cost probably will reach \$4,100.

Springfield, O.—Park extensions along Buck Creek have been recommended to council.

Toledo, O.—Council will reconsider plans for extension of Woodruff Ave.

Toledo, O.—Bids will be received until May 29th for \$55,000 bond issue for highway improvement. D. L. Mackey is Auditor, Ottawa County.

Portland, Ore.—Preliminary plans for proposed extension of Stark St. from 13th St. to Cornell road and estimated costs of project have been completed by city engineer and whole project soon will be presented to council.

Portland, Ore.—Proposed bond issues for improving highways are to be voted on May 19 as follows: Umatilla county, \$980,000; Union county, \$400,000; Coos county, \$362,000.

Salem, Ore.—Wasco County contemplates bond issue for completion of Columbia Highway through that county.

Conyngham, Pa.—Bids will be called for shortly on paving streets with amiesite.

Erie, Pa.—City council considering ordinance calling for grading, curbing, draining and paving Twentieth St. and making appropriation therefor.

Haverford, Pa.—Indebtedness of Haverford township has been increased from \$52,000 to \$109,000 to provide for improved highways. A big stretch of Llanerch, known as Shimer tract is to be taken over and roads placed on township plan as public thoroughfares.

Johnstown, Pa.—Cambria County Commissioners have issued instructions to Supervisor Welmer, of Upper Yoder Township, to open up Cambria County's end of Ligonier road and Westmoreland officials announced their intention of having same work started over line.

Kittanning, Pa.—\$50,000 is available for construction of Highway Route No. 203 between this city and Ford City. Mr. W. D. Uhler is Chief Engineer, Harrisburg, Pa.

Charleston, S. C.—Resolution has been passed for paving on Cannon St., at cost of about \$14,000.

Charleston, S. C.—Petitions for paving Chinquapin St. with asphalt; Charlotte St. between Alexander St. and Meeting St. with asphalt, and Chinquapin St. between Cannon St. and Spring St. with asphalt, have been referred to committee on streets.

Huron, S. D.—Commissioners have adopted resolution ordering paving to be done on Third St.

Bristol, Tenn.—Indications are that residents on Taylor St. and Maryland Ave. will agree to having street 20 feet wide instead of 24 feet and work will start as soon as the \$36,000 bond issue can be sold.

Bristol, Tenn.—Prudential Insurance Co. of America, of Newark, N. J., was successful bidder for \$36,000 street improvement bonds sold by Bristol, Tenn., city commission, the proceeds of which are to be used in building cement streets in Fairmount. Newark company paid premium of \$1,100 on bonds. Of this amount \$967 was on \$28,000 6 per cent bonds, and \$133 was on \$3,000 5 per cent bonds.

Ballinger, Tex.—Town contemplates expenditure of about \$15,000 for road work.

Bonham, Tex.—Fannin county voted \$150,000 bonds for road construction.

Dallas, Tex.—Proposition to pave new boulevard with concrete at estimated cost of \$20,000 is being considered.

El Paso, Tex.—Plans are being discussed for completion of main county road to Anthony, N. M., at cost of \$200,000.

Henderson, Tex.—Voters of Rusk County will pass on issuance of \$400,000 good roads bonds, July 7.

Hillsboro, Tex.—Citizens of 2d St., between Abbott and Ivy Sts., have issued call for meeting to determine what kind of paving is to be used on their streets.

Ladonia, Tex.—Contracts for about 25 miles of permanent road will be let soon.

Leonard, Tex.—Town has voted \$80,000 good roads bonds.

Port Aransas, Tex.—City voted \$10,000 bonds to build its portion of highway to Padre Island; 14-mile road.

Waxahachie, Tex.—City council has passed orders for the paving of about a mile of streets in residence district.

Ogden, Utah.—Upon recommendation of Commissioner Chris Flygare, superintendent of streets and public improvements, city commission has authorized purchase of 11,100 gallons of tarvia at 10½ cents a gallon for use on canyon boulevard.

Ogden, Utah.—Commissioners have published notice of intention to improve streets by necessary grading, draining and construction of sidewalks at estimated cost of \$8,250. Walter Richey is City Recorder.

Salt Lake City, Utah.—City commission has been petitioned for paving on Second West St. It is estimated that it would cost about \$22,000 to lay a 16-ft. pavement and about \$40,000 to lay an 18-ft. roadway.

Salt Lake City, Utah.—Alternative bids on bitulithic, concrete and asphalt will be asked for paving State St.

Bristol, Va.—Council contemplates purchase of an automobile truck for street work.

Gate City, Va.—Scott county voted \$43,000 bonds for road construction.

Norfolk, Va.—Ordinance recommended by Seventh Ward local board for issue of \$190,000 bonds for street improvements has been referred to finance committee.

Norfolk, Va.—Route for proposed boulevard between Virginia Beach and Norfolk has been selected. It will be road in Seaboard district. It is proposed to raise \$8,000 by subscriptions and the county will ask State for another \$8,000.

Rustburg, Va.—Campbell county voted \$200,000 bonds for road construction.

Fairmount, W. Va.—Marion county voted \$650,000 bonds for constructing 35-mile highway.

West Union, W. Va.—Doddridge county votes June 13 on \$200,000 bonds to construct roads.

Tacoma, Wash.—Council has passed ordinance authorizing paving of alley between Grant and Ainsworth Aves. at \$2,394.30.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates contract awarded.)

Tempe, Ariz.—Studebaker Corp., South Bend, Ind., for supplying new up-to-date sprinkling wagon.

San Francisco, Cal.—For improving streets as follows: 25th Ave between Balboa and Cabrillo, *A. E. Buckman, for \$3,962; Seaward, between Douglass and Clover Heights, *Eaton & Smith, \$5,397; crossing of Geary and 39th Ave, *Owen McHugh, \$1,730.

Stockton, Cal.—Clark & Henery for paving with asphalt macadam at \$61,866.42. Other bidders were as follows: Paul & Caldwell, \$66,537; Johnson, Shea Co., \$78,461.96; Ransome-Crummey Co., \$78,211.42; Federal Construction Co., \$63,531. Engineer's estimate, \$77,472.89.

New Canaan, Conn.—For 8,400 sq. yds. reinforced concrete pavement on 6-in. foundation, 3,500 cu. yds. earth excavation: *W. H. Arthur, Stamford, Conn., at \$1.68 complete per sq. yd., total bid, \$18,725.35.

Jacksonville, Fla.—*J. B. McCrary Co., for building Tainiami Trail as far as Lee County line at cost of \$241,500, exclusive of engineer's work, which will probably amount to about \$7,000.

Chicago, Ill.—*Central Paving Co., for constructing concrete curbs, grading and paving with vitrified brick on several streets.

Angola, Ind.—For 17,000 sq. yds. brick pavement on 6-in. concrete foundation, clay excavation, as follows: Patton & Son, Veedersburg, Ind., at \$1.93 per sq. yd.; total \$37,980.65; Brook Const. Co., Fort Wayne, Ind., at \$2.03, total \$39,795.02; Federal Asphalt Paving Co., Hamilton, O., at \$1.79, total \$37,155.60. C. F. Powers is City Engr.

Bedford, Ind.—*Walter F. Norman for Bedford and Clear Springs gravel road at \$2,264.

Boonville, Ind.—By commissioners of Warrick county for construction of system of roads known as Dorsey Reed system of roads in Boonville and Boon township: *Traylor & Kemp, of Jasper, Ind., at \$84,318. There were five other bidders, bids ranging up to \$90,000. An appeal from decision of Board of Commissioners has been taken to Circuit Court, where decision is expected at next term of court.

Brookville, Ind.—*Theo. Heidlage, Oldenburg, Ind., for free gravel road at \$7,825. Chas. G. Reifel is Auditor.

Cannelton, Ind.—*Federal Contracting Co., Indianapolis, Ind., for constructing 60,435 sq. ft. concrete walks at 9½ cts. per sq. ft. Fred Berger is City Clerk.

Decatur, Ind.—For constructing macadam road, as follows: *L. O. Bears & Co., Geneva, Ind., at \$5,979; Christ Musser, Monroe, Ind., at \$6,387; Merryman & Fugate, Monroe, Ind., at \$6,686. T. H. Baltzell is Auditor.

Indianapolis, Ind.—For road material as follows: *Indian Refining Co. and *Standard Oil Co. for supplying oil; *Spencer Stone Co., *A. F. Zeigler Contractors' Supply Co., *Ohio & Indiana Stone Co., *A. B. Meyer & Co., *Frank M. Dell for crushed stone; *Central Gravel Co. for washed gravel.

La Porte, Ind.—*Geo. M. Gross, local, for macadamized road at \$4,889. Fred A. Hausheer is Auditor.

Marion, Ind.—For road work in Grant County, Ind., as follows: *John A. Jones, Fairmont, Ind., for 10,687 ft. stone road at \$9,374; Glen Benefield, Marion, Ind., for 10,330 ft. stone and tar road at \$14,480.

Newport, Ky.—*Edward Knepple at \$16,986 for paving Water Works Road with brick.

Paducah, Ky.—*Kelly-Springfield Road Roller Co., Springfield, O., for ten-ton gasoline street roller and scarifier at \$2,650 (old steam roller given in on deal).

Paducah, Ky.—*Harold & Harting, of McCracken County, for constructing 2 miles of road, at \$4,521.99.

Maine.—For highway construction as follows: Bethel, 4.38 miles, gravel surface—*Marco Lavorgna, Canton, Me., \$23,577.19; James McGregor, Rumford, Me., \$36,429.22; James H. Kerr, Rumford, Me., \$27,393.35; Greenwood, 1.33 miles, gravel surface—James H. Kerr, Rumford, Me., \$10,957.63; Marco Lavorgna, Canton, Me., \$8,986.64; Guilford, 3.20 miles, gravel surface—John G. Fleming, Lincoln, Me., \$24,540.17; Noyes & Campbell, Augusta, Me., \$23,842.22; *James H. Kerr, Rumford, Me., \$22,328.95; Garland, 1.22 miles, gravel surface—*Noyes & Campbell, Augusta, Me., \$13,000; Burnham, 2.53 miles, gravel surface—*John G. Fleming, Lincoln, Me., \$10,820.40; E. T. Mitchell, Oakland, Me., \$18,598.70; Dominic Susi, Burnham, Me., \$16,846.15; Doran & Fellows, Mercer, Me., \$13,564.35; Benton, 0.40 mile, gravel surface—Noyes & Campbell, Augusta, Me., \$4,497.76; Dominic Susi, Burnham, Me., \$5,559.32; Clinton, 4.89 miles, gravel surface—E. T. Mitchell, Oakland, Me., \$40,214.98; Noyes & Campbell, Augusta, Me., \$39,558.80; *Doran & Fellows, Mercer, Me., \$28,681.88; Dominic Susi, Burnham, Me., \$39,594.42; Newport, 0.63 mile, gravel surface—James H. Kerr, Rumford, Me., \$14,995.21; Noyes & Campbell, Augusta, Me., \$15,109.55; Bridgewater, 6.55 miles, gravel surface—A. Williams Co., 27 Lowell St., Boston, Mass., Sullivan, 0.50 mile, gravel surface—*Bradbury Smith, West Sullivan, Me., \$3,042.74.

North Adams, Mass.—*Joseph Guilbo, for construction of retaining wall at Little Woods at cost of \$3,600.

Gulfport, Miss.—For construction of new beach road as follows: Brick—H. S.

Mathews, Birmingham, Ala.—3-in. brick laid flat with sand filling, \$1.20 per sq. yd.; 3-in. brick on edge, sand filling, \$1.40 per sq. yd.; 3-in. brick laid flat, with cement grout filling, \$1.28 per sq. yd.; 3-in. brick on edge, with cement grout filling, \$1.48 per sq. yd.; 3½-in. wire cut lug brick, grout filler, \$1.34 per sq. yd.; 3-in. wire cut lug brick, with grout filler, \$1.34 per sq. yd.; side cut lug brick, grout filler, \$1.28 sq. yd. Ala. bama Paving Co., Birmingham, Ala.—3-in. brick laid flat, sand filler, \$1.22½ per sq. yd.; 3-in. brick on edge, sand filler, \$1.42½; 3-in. brick laid flat, grout filler, \$1.31½; 3-in. brick on edge, grout filler, \$1.51½; side cut lug brick, grout filler, \$1.37½. Southern Paving Construction Co., Chattanooga, Tenn.—3-in. brick laid flat, sand filler, \$1.21; 3-in. brick on edge, sand filler, \$1.40; 3-in. brick laid flat, grout filler, \$1.29; 3-in. brick on edge, grout filler, \$1.49; 3-in. wire cut lug brick, grout filler, \$1.35. Concrete: H. S. Mathews, Birmingham, Ala.—Plain concrete, \$1.15½ per sq. yd.; reinforced concrete, \$1.28 per sq. yd. W. J. Commerford, New Orleans—Plain concrete, \$1.44 per sq. yd.; reinforced concrete, \$1.54. Worthington Construction Co., Lafayette, La.—Plain concrete, \$1.37 per sq. yd.; reinforced concrete, \$1.49 per sq. yd. Chattanooga Quarry & Construction Co.—Plain concrete, \$1.19½ per sq. yd.; reinforced concrete, \$1.31½. Preston Small Construction Co., Macon, Ga.—Plain concrete, \$1.22½; reinforced concrete, \$1.34. Anderson, Sarlis & McCloud, Jackson, Mich.—Plain concrete, \$1.22; reinforced, \$1.35½. Eureka Paving Co., Houston, Tex.—Plain concrete, \$1.51½; reinforced, \$1.78. Wood block: Chickamauga Quarry & Construction Co.—Per sq. yd., \$2,41.6. Eureka Paving Co., Houston, Tex., per sq. yd., \$2.33. Southern Paving Construction Co., Chattanooga, Tenn.—Per sq. yd., \$2.01. Warrenite: Southern Bithulithic Co., Nashville, Tenn.—\$1.72 per sq. yd. Rocmac: W. J. Commerford, New Orleans—\$1.50 per sq. yd. Rocmac Road Corporation of America, Birmingham, Ala.—\$1.18 per sq. yd. Curbing: The average price bid for curbing is 12½ cts. per lin. ft. Five firms submitted bids on curbing.

Kansas City, Mo.—For county road jobs as follows: For grading, draining and macadamizing of Owens Schoolhouse road, distance of 4½ miles: Kansas Crusher Co., \$39,408; Phillips & Winfrey, \$42,546. On grading, draining and macadamizing of Valley road, running from the Spring Branch road, 4 miles to Lake City, two bids; W. M. Spencer, \$33,319; Kansas Crusher Co., \$34,277. On the grading of two large hills on the Swope Park and Hickman Mills road, three bids; Kansas Crusher Co., \$27,826; Davidson Construction Co., \$24,252; Robert Mass, \$28,069. On the grading, draining and macadamizing of the C. A. Duck road, 3 miles long, between Grandview and Martin City, two bids; the Kansas Crusher Co., \$57,735; the Davidson Construction Co., \$52,965. On Frank Frick road, running from Oak Grave east to the Lafayette County line, two bids; the Kansas Crusher Co., \$9,757; the Davidson Construction Co., \$9,685.

Fremont, Neb.—Following low bids received for paving three districts: Class C—Repressed brick block on inches thick, A. D. Sears, \$1.39. Class C—Repressed brick block on 4-in. concrete base with asphalt filler, Ford Paving Co., \$2.16. Class D—3-in. vertical fibre brick on 4-in. concrete base with asphalt filler, Ford Paving Co., \$1.86.

Lincoln, Neb.—For paving 10,890 sq. yds. with asphalt, 2,870 sq. yds. with brick, 5-in. concrete foundation: Ford Paving Co., Cedar Rapids, Ia., was lowest bidder at \$1.54 per sq. yd. for asphalt, 40 cts. excavation, total \$27,960; \$2.20 per sq. yd. for brick with asphalt filler.

Bayonne, N. J.—For 83,000 sq. yds. asphalt pavement with 5-in. concrete and old macadam base, earth excavation, as follows: *W. T. S. Crichtfield, Hoboken, N. J., at \$1.80 per sq. yd. for paving, total \$96,202.28; *Cleveland Trinidad Paving Co., Cleveland, O., at \$1.78 per sq. yd., total \$9,035.40. Prices given are average price for asphalt on concrete foundation and include excavation. Walter L. Clarkson is city engineer.

Camden, N. J.—For resurfacing King's Highway, Haddonfield: *J. F. Shanley & Co., for \$12,227.43. The same firm was awarded contract for improvement of Kaighn Ave. for \$7,414.44.

Roselle, N. J.—For repair of Chestnut St. from First St. to Sixth St.: *C. H. Winans Co. at \$3,023.88. Another bidder was Weldon Contracting Co., of Rahway, at \$3,703.60.

Bath, N. Y.—*Kennedy Construction Co. of Albany for repairing total of 63.12 miles of state road in Steuben county at \$26,517.97.

Batavia, N. Y.—*Thomas Holahan, Rochester, N. Y., for paving School St. with brick for distance of 800 feet at \$7,810.50.

Hudson, N. Y.—For finishing and resurfacing Blue Stone to Nevis road with a 2½-in. top dressing and treating roads with coal tar and gravel as follows: Repair contract 895, Columbia County, 10.13 miles—Jas. Walker Const. Co., Albany, \$3,568.96; Conway Bros. & Kennedy, Edenville, N. Y., \$3,613.96; County Const. Co., Troy, \$3,878.13. Repair contract 923, Columbia County, 2.80 miles—Jos. Walker Const. Co., Albany, \$10,501; Thos. J. Martin, Beacon, N. Y., \$11,025; County Const. Co., Troy, \$11,494; Rumpf & Stevens, Lake Placid, N. Y., \$12,063; F. G. Gallagher & Co., Inc., Kingston, \$13,348.

Patchogue, N. Y.—For construction of concrete road as follows: Gifford Const. Co., Jamaica, N. Y., at \$19,770; E. F. Monohan, Manhattan Beach, N. Y., at \$20,750; Murray & Gardner, Moriches, N. Y., at \$21,330.

Saranac Lake, N. Y.—For repairs of highways, as follows: Warren county—Wevertown-North Creek Rd., about 6½ miles, in town of Johnsbury, John Anderson, Newcomb, low, \$8,429; Gleason & Davitt, Albany, \$8,509. Clinton county—Plattsburg-Keeseville Rd., about 3½ miles, Deane Corporation, Ticonderoga, at \$12,242.46; Spellman-Oliver Co., Chateaugay, \$12,304.72; Kellogg-Boydton Co., Keeseville, \$12,840.31. For repairs contract No. 907, constituting 17.06 miles in Franklin county, as follows: Kellogg-Boydton, Keeseville, \$5,387.60; Rock & Griffin Co., Watertown, \$5,429.65; Richard Hopkins, Troy, \$5,670.70; W. T. Thayer, Chateaugay, \$5,742.14; Guy H. Miller, Watertown, \$6,689.35.

Schenectady, N. Y.—For resurfacing 5.31 miles of Amsterdam Rd.: *Brown & Lowe, of this city, the low bidders, for \$27,749.10.

Schenectady, N. Y.—For repair work on several state roads in county, amounting to a total of 11.79 miles: *Paul Schultz, of Albany, low bidder, for \$4,112.75.

Syracuse, N. Y.—For repairing state and county highways: Edwin Styring, local, at \$30,582.60; Richard Hopkins of Troy, at \$31,675.47, and Kennedy Construction Co. of Albany, \$32,274.80. Contract covers 78 miles of improved state and county highways in Onondaga county. It calls for surface treatment, such as oiling and restoring broken and worn-out places.

Utica, N. Y.—By Harry W. Roberts & Co., for paving as follows: Walnut St., West Ave. to York St.: Sheet asphalt, natural curb, \$10,375; artificial curb, \$9,270.50; bitulithic, natural curb, \$11,240.65; artificial curb, \$10,136.15; asphaltic concrete, natural curb, \$9,957.10; artificial curb, \$8,852.60. Butterfield Ave. and Butterfield Pl., Auburn Ave. to Margaret St.: Sheet asphalt, natural curb, \$7,731.85; artificial curb, \$6,950.24; bitulithic, natural curb, \$8,384.35; artificial curb, \$7,602.74; asphaltic concrete, natural curb, \$7,416.85; artificial curb, \$6,635.24. Auburn Ave., Genesee St. to Howe St.: Sheet asphalt, natural curb, \$6,962.75; artificial curb, \$6,142.60; bitulithic, natural curb, \$7,490.55; artificial curb, \$6,670.40; asphaltic concrete, natural curb, \$6,707.95; artificial curb, \$5,887.80. Bennett St., Newel St. to Pleasant St.: Sheet asphalt, natural curb, \$5,240.60; artificial curb, \$4,691.64; bitulithic, natural curb, \$5,693; artificial curb, \$5,144.04; asphaltic concrete, natural curb, \$5,088.20; artificial curb, \$4,473.24.

Wilson, N. C.—For 40,000 sq. yds. bitulithic pavement on 4-in. concrete base, 1,000 cu. yds. clay loam excavation, as follows: R. G. Lassiter & Co., Oxford, N. C., at \$1.73 per sq. yd. for paving, 30 cts. per cu. yd. excess price; Atlantic Bitulithic Co., Richmond, Va., at \$1.87 and 50 cts. respectively. Price per sq. yd. includes sub grade to depth of pavement. Any excess paid for at cu. yd. price. Anderson & Christie, Inc., Charlotte, N. C., are Engrs.

Cincinnati, O.—For county work as follows: John Rueble & Co. were lowest of six bidders for work of improving Caldwell drive in Springfield Township

at \$33,672.90. For repair of Pleasant Ridge Rd., Nugent & Hine were low with bid of \$11,300. William P. Flynn was best on bid for repairing Hamilton Pike at \$5,941.

Cincinnati, O.—For road improvement as follows: *Peter Praechter, at \$15,091.60, for repair of Engler Mill Rd., from Camargo Pike to Montauk Rd.; *George W. Rich, at \$9,016, for repair of Camargo Pike, from Loveland and Madeira Rd. to Miamiville Bridge; *Van Camp Bros., at \$9,069, for repair of Three-Mile Rd., from New Richmond Pike to Mt. Washington; bid of \$9,737, for improvement of Wesselmann Rd., from Harrison Pike to Bogart Rd.

New Albany, O.—*Equitable Asphalt Maintenance Co., Kansas City, for repairing asphalt streets at \$1 per sq. yd. *Staebler & Griggs for brick improvement of Oak St. at \$4.15 per foot and for macadam improvement of Conserva-tive St. at \$2.93 per foot.

Piqua, O.—Contract for paving Broadway has been re-awarded because letting was advertised for street as a whole and not in sections. *Hinkle & Sullivan, Cincinnati, O., for paving about 21,000 sq. yds. with bitulithic, at \$2.15 per sq. yd., total bid, \$45,150.

Urbana, O.—*Edward Murray, Dayton, O., for paving Miami St. with Metropolitan brick at \$43,325.50.

Portland, Ore.—Reported that contracts will be let as follows: Viaduct for crossing under tracks at Fairview, on Fairview-Gresham road, Robert Lee Ringer, \$2,548.85; Canyon road, Coast Construction Co., \$17,526; Capitol highway, Andrew & Harter, \$3,110.60; Columbia River highway, Warren Construction Co., \$13,691.60, and Pacific highway, E. T. Johnson, \$12,166. Others bids were as follows: Fairview viaduct, Litherland-Abrey Co., \$2,747.64; Andurs & Bode, \$2,769.75; Coast Contracting Co., \$2,936.75; Moore Bros., \$3,225.97; Shulohm Co., \$3,859.30, and Edward Sandberg, \$5,275. Canyon road, E. T. Johnson, \$19,529; T. H. Cochran & Sons, \$28,762; Tobin & Stevens, \$20,261. Capitol highway, T. H. Cochran & Sons, \$3,357.83; Tobin & Stevens, \$3,342.72. Pacific highway, Tobin & Stevens, \$3,342.72. Warren Construction Co.'s bid for figure 8 on highway at Crown Point includes an item of \$24.18 for ten years maintenance.

Erie, Pa.—*Willis Bancroft, Jr., for grading East Twenty-eighth St. on bid of 27 cts. per sq. yd. Estimated cost, \$3,500.

Harrisburg, Pa.—For furnishing and applying bituminous surface treatments as follows: *Headley Good Roads Co., Philadelphia, Pa., for 663,596 gallons in District No. 1; also for 262,591 gallons in District No. 2; *Good Roads Co., Baltimore, Md., for 4,390 gallons in District No. 3; *Atlantic Refining Co., Philadelphia, Pa., for 83,007 gallons in District No. 4.

Providence, R. I.—For building 210,000 sq. yds. of bituminous macadam road, as follows: *Amos D. Bugdyes Sons, Hazardville, Conn.; *Chas. S. Towle, 52 Vanderbilt Ave., New York; *Lane Construction Corp., Meriden, Conn.; *Jos. McCormick, East Providence, R. I.; *T. J. Quinn, Ashton, R. I.; *A. Vito Construction Co., Thompson, Conn.; *Callan Construction Co., Bristol, R. I.

Providence, R. I.—For section of State Highway from Narragansett Pier through Wakefield in the towns of Narragansett and South Kingstown. Length 2.99 miles: Oscar W. Rackle, \$38,825.84; *Charles W. Towle, \$35,443.71. Section of State Highway upon New London Turnpike, in city of Cranston, 2 miles in length: Joseph McCormick, \$22,374.20; *Lane Construction Co., \$21,564.10; B. D. Savage, \$28,624.30; Oscar W. Rackle, \$21,578.10; Ahern Construction Co., \$24,049.10; E. J. Tracy, \$22,774.80. Section of State Highway upon Hartford Pike in town of Johnston, 2 miles in length: Lane Construction Co., \$30,212.30; *Joseph McCormick, \$29,357.07; Oscar W. Rackle, \$25,934.

Columbia, S. C.—*Atlantic Bitulithic Co., Richmond, Va., for 17,000 sq. yds. street paving, at \$1.96 per sq. yd. on 5-in. concrete base, including grading and 66c. per lin. ft. for granite curbs. Bitulithic paving. Total cost about \$35,000.

Dallas, Tex.—*Vibrolithic Co., for paving Young St., at \$32,487.15, and Wood St. at \$4,378.96.

Salt Lake City, Utah.—*P. J. Moran, for paving 11th East St., at \$76,107.11. *Strange and Maguire, for paving 6th Ave., at \$19,025.43.

Colfax, Wash.—For 42,876 sq. yds. macadam pavement with 6-in. crushed rock foundation, 50,081 cu. yds. common excavation, one 100-ft. concrete arch bridge as follows: Carlson & Schwadahl, Spokane, at \$44,170.50; *G. L. Stickler, Johnson, at \$41,547; H. H. Boomer Co., Spokane, at \$48,644; Mitchell Bros., Spokane, at \$42,200.

Seattle, Wash.—Following contracts have been let by King County Commissioners: *F. McLellan, Seattle, for lump sum including grading, etc., of \$222,691.22, for Seattle to Des Moines Rd., 9.62 miles. Contract will complete paved highway 20 ft. wide with turn-outs, headers and curbs of monolithic type of brick pavement, consisting of a concrete base 1:3:6 mixture, 3 ins. thick at the edge and 5½ ins. at the center. Cement sand cushion ¼-in. thick 1:1 mixture. Vertical fibre wire cut brick 4 ins. by 2½ ins. by 8½ ins. laid flat and grouted with 1:1 mixture. *J. H. McEachern, Seattle, at \$32,995, for Vashon Ferry Terminals. Construction of two docks and ferry slips with apron pontoon for new Vashon ferry now building. *J. M. Clapp, Seattle, at \$41,351, for Enumclaw-Auburn Rd., 2.54 miles. Contract will complete paved highway 20 ft. wide with one course concrete 1:2:3 mixture. *Cascade Construction Co. for \$84,400 for Bothell-Snohomish County-Woodinville Rd., 3.61 miles of brick. Contract will complete paved highway 18 ft. wide of No. 2 brick block on a 5-in. concrete base, 1:3:6 mixture and one course concrete 1:2:3 mixture. Arthur P. Denton is County Engr.

Spokane, Wash.—*Spokane Asp. Mac. Pav. Co., Spokane, at \$39,750, for paving 37,600 sq. yds. with asphalt macadam, on 4½-in. crushed rock foundation, earth, loose rock and rock excavation. Other bidder was Mitchell Bros., Spokane, at \$38,964. C. A. McClung is Ch. Dept. Co. Engr.

Menominee, Wis.—For 10,000 sq. yds. concrete pavement: *Cast Stone Construction Co., Eau Claire, Wis., at \$1.14 per sq. yd.; total \$11,857.

Racine, Wis.—*Western Improvement Co., 840 Ninth St., Racine, for paving with sheet asphalt on 5-in. concrete base at \$1.99 per sq. yd. P. H. Connolly is City Engineer.

SEWERAGE

Los Angeles, Cal.—Ordinance of intention adopted for construction of sanitary sewer in Mont Clair St. between Fifth and Sixth Aves.

De Funiak Springs, Fla.—Town has voted in favor of bond issue for sewerage system, but against water works system.

Chester, Ill.—City contemplates construction of sewer system in near future. Address Gene Beare, City Clerk.

Springfield, Ill.—Board has passed resolution calling for construction of 18-in. vitrified crook pipe sewer in Peoria Rd.

Springfield, Ill.—Board has approved petition calling for laying of sewer in North Ninth St. for distance of 180 ft. from Wood Ave. It will be vitrified crook type, 18 ins. in diameter.

Huntington, Ind.—Board of Works will receive bids for construction of sewer on Henry St. from Rabbit Run sewer to Joe St.

Irrington, Ind.—Board of Public Works contemplates construction of two drainage sewers at estimated cost of \$33,000.

Muscatine, Ia.—Drury drain district will be called upon to vote on \$64,000 bond issue this year as result of the breaking of levee opposite this city. Members of the district board are now preparing issue which will cover annual expenses and provide fund of \$50,000 for reconstruction of levee.

Haverhill, Mass.—Order has been passed for construction of sewer in Marsh Ave. from Winona Ave. to North Ave., at cost not to exceed \$2,000. Petitions for sewers in several streets have been referred to Alderman Wood.

Pittsfield, Mass.—Ordinance has been introduced calling for loan of \$19,500 for construction of sewers in six streets.

Pittsfield, Mass.—The \$25,000 order for drains on Tyler St., Brown St., Pine St., Dalton Ave. and Springside Ave. has been adopted by both branches of City Council.

Detroit, Mich.—Report of Clarence W.

Hubbell, consulting engineer, on sewage disposal and water purification, has been transmitted to common council. He advises construction of sewerage system to cost \$6,091,000 (estimated). This includes intercepting sewers carrying sewage to two treatment plants, at Fort Wayne and at Fairview, where it would be treated in Imhoff tanks and by disinfection with hypochlorite of lime. Provision is made for future treatment works at Connor's Creek. In discussing water supply Mr. Hubbell advises construction of additional intake between Belle Isle and Peche Island, and need of filtration plant is suggested.

Flint, Mich.—Council has passed resolutions for construction of sewers in several streets.

Flint, Mich.—Petition for sewer in Stevenson St. referred to sewer committee and engineer.

Sault Ste Marie, Mich.—See "Streets and Roads."

Carthage, Mo.—City contemplates construction of storm sewer in West 10th St. district at estimated cost of \$5,000. City engineer has been directed to draw exact plans and specifications.

Point Pleasant, N. J.—Special election May 8 was carried authorizing issue of bonds amounting to \$21,000 for extension of boro sewer system, an addition 10x37 ft. to disposal tank, and a new ocean outlet pipe 750 ft. in length.

Binghamton, N. Y.—Peoples Trust Co., Binghamton, has been awarded contract for \$150,000 intercepting sewer bonds at premium of \$225. Entire issue was once sold to Farson, Son & Co., but when bond experts who reviewed method of issue declared that certain technicalities had not been complied with and refused to certify to legality of the issue, purchasers declined to take securities and they were readvertised.

Dunkirk, N. Y.—Common Council has declared its intention to lay a 6 and 8-in. tile sewer-lateral in and along center line of Nicholas Ave. from a connection with the present sewer in Brooks Ave. to Second St.

Hamburg, N. Y.—Hamburg will hold special election on May 12 to vote on propositions to install sewer system, to construct a drain to protect low-lying property from floods, and to buy motor fire-apparatus.

Lyons, N. Y.—See "Miscellaneous."

Oriskany, N. Y.—City has voted to appropriate \$40,000 for construction of sewer system and disposal plant.

Rochester, N. Y.—See "Streets and Roads."

Schenectady, N. Y.—City will sell \$60,000 sewer bond issue May 20th. Leon G. Dibble is Comptroller.

Syracuse, N. Y.—Plans and specifications have been practically completed by engineers of Syracuse Intercepting Sewer Board for advertising for bids to improve Onondaga Creek between South Ave. and Cortland Ave., to care for flood conditions and for sanitary purposes.

Utica, N. Y.—City Engineer Joseph Kemper has filed plans and specifications for construction of sewers in several streets.

Yonkers, N. Y.—Resolution has been adopted directing city engineer to prepare plans and specifications for sewer in McLean Ave.

Coshocton, O.—Council considering ordinance calling for constructing bond issue for constructing sewer in East Chestnut St.

Youngstown, O.—Ordinance passed for construction of sewer in Market St.

Portland, Ore.—Council contemplates taking steps for reconstruction of Tanner Creek sewer at estimated cost of \$225,103.

Erie, Pa.—Ordinance has been introduced calling for construction of storm water sewer in Thirtieth St.

Johnstown, Pa.—Council has passed ordinance providing for loan of \$200,000 to be used for payment of cost of building a 2-mile, 62-in. sewer main from the site of proposed sewage disposal plant in Lower Yoder Township to point about 700 ft. above Coopersdale bridge.

Johnstown, Pa.—Mayor Franke has mailed plans for proposed sanitary sewer system and laterals for all streets which are to be paved this summer to State Department at Harrisburg for approval.

Providence, R. I.—See "Miscellaneous."

Woonsocket, R. I.—Council has appropriated \$21,000 for sewer construction.

Sumter, S. C.—Council will revise sewer connection ordinance on recommendation of Board of Health.

Greenville, Texas.—An election providing for issuance of \$100,000 in bonds for building of sewage disposal plant and new mains carried here May 6 by vote of more than three to one.

Johnson City, Tenn.—City has called for bids for sewer construction to be received June 6. P. F. McDonald is City Engineer.

San Angelo, Tex.—San Angelo citizens may shortly either buy the privately-owned sewerage system here or construct one of their own. The matter is now being discussed.

Montreal, Can.—Bids to be received May 2nd for sewer outlet were cancelled and will be called for later. L. N. Senecal, Secy. Bd. of Commissioners.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates contract awarded.)

Richmond, Cal.—For grading and constructing sewer system in Canal Sub-Division for Richmond Canal & Land Co.: *Richmond Dredging Co., Richmond, at about \$80,000. H. W. Wernse is secy. retary.

Stockton, Cal.—*Chambers & Heafey for lateral sewers in Villa addition at \$4,877.08. Other bidders were as follows: W. F. Edwards, \$4,967.78; F. C. McIntire, \$5,155.95; W. S. Gause, \$5,494.65. Engineer's estimate, \$6,275.

Stockton, Cal.—*W. F. Edwards, for lateral sewers in Fair Oaks addition at \$11,978.57. Other bids were: Chambers & Heafey, \$12,116.54; F. C. McIntire, \$12,316.55; Homer C. Hamlin, \$13,334.11; L. L. Paige, \$15,039.14. City Engineer's estimate amounted to \$14,344.54.

Newark, Del.—Smith & Ruggle, Baltimore, Md., were lowest bidders at about \$10,000 for constructing proposed sewer extension.

Grays Lake, Ill.—*Inbenkrub Co., Joliet, Ill., for vitrified pipe sewer at \$16,401.61. Contract includes 60 concrete manholes, 4 flush tanks, 1 settling tank. D. G. White is Village Clerk.

Hartford City, Ind.—*North, Frazier & Co. for Rapp No. 1 drain, at \$2,875. Other bidders were as follows: Williamson Brothers, \$2,879.50; Portland Drain & Tile Co., \$2,900; W. A. Inman, \$3,000; Jacob Burnsworth & Son Tile Co., \$2,743.

Kokomo, Ind.—For Kirk sewer, as follows: Fred Davenport, \$1,125 for single strength tile and \$1,120 for double strength tile; J. H. Watson, \$1,200 for double strength under streets and single strength remainder of way, and \$1,288 for double strength throughout; D. L. Barnett bid \$1,195.50.

South Bend, Ind.—*L. H. Webster for construction of sewer on Indiana Ave.

Lexington, Ky.—*A. G. McGregor for North Upper St. sewer at \$1,757.50; *Louis des Cognets Co., for North Bway sewer at \$1,783.50, and Elsmere Park sewer at \$1,601; *Carey-Reed Co., for Davidson Court sewer at \$520.60.

Brookline, Mass.—For 12-in. pipe sewer in Amory and Freeman St.: *James Driscoll & Son Co., 94 Washington St., Brookline, at \$18,226. Henry A. Varney is Engr.

Marlboro, Mass.—For extending sewer system: *Warren & Co., to cost approximately \$62,000.

Bay City, Mich.—For constructing 2,092 ft. 12-in. cement tile sewer, 1,052 ft. 10-in. sewer as follows: I. A. Seder, 2001 Broadway, Bay City, at \$1,883; Thos. Kent & Co., \$316 S. Sheridan St., Bay City, at \$1,490; Thos. Lardner, 1007 13th St., Bay City, at \$604. H. C. Thompson is City Engineer.

Little Falls, Minn.—*Axel Setterstrom, for constructing 1,940 ft. of sewer pipe, at \$2,640.

Carthage, Mo.—*P. J. McNerney for construction East Fifth St. sewer at estimated cost of \$3,226, and Macon St. sewer at estimated cost of \$3,009.

Ridgefield, N. J.—For sewerage system and sewage-disposal plant: *Cavanagh Contracting Co., 150 Nassau St., New York, N. Y., at \$87,617. Charles F. Blood is engineer.

Utica, N. Y.—For storm water sewers as follows: Lincoln Ave.—John R. Baxter, \$2,675.90; Frank M. Johnston, \$3,105.91; *Arthur W. Fitch, \$2,300.62; Dominic Perritano, \$2,055. Auburn Ave.—*Baxter, \$976.38; Johnston, \$1,219.65; Fitch, \$1,032.25; Perritano, \$1,017.31. Greenwood Court—*Baxter, \$308.62; Johnston, \$372.68; Fitch, \$325.15; Perritano, \$291.45. Hampden Pl.—*Baxter, \$337; Johnston, \$376.80; Fitch, \$347.05; Perritano, \$323.85. Margaret St.—*Baxter, \$280.50; Johnston, \$280.06; Fitch, \$253.67; Perritano, \$232.65.

Mount Union, Pa.—*Fogel & Co., Hol-

lidsburg, Pa., for vitrified clay pipe sewer at \$5,694. Other bidder was Thermic Coal & Supply Co., Hollidsburg, Pa., at \$7,882.50. D. W. Dillmar is Engr.

Ogden, Utah.—For constructing pipe sewers in Sewer Districts Nos. 130 and 132: *Green Engineering & Construction Co., Tooele, Utah. Walter Rieley is city recorder.

Spokane, Wash.—*Spokane Corrugated Culvert and Tank Co. for supplying 1,000 ft. of corrugated drain pipe at \$595.

Chippewa Falls, Wis.—*G. W. Mulholland, Kaukauna, Wis., for West Spring St. sewer at \$3,302.78.

Mount Horeb, Wis.—*C. H. Phillips, Waupaca, Wis., for laying 6-in. pipe sewer at 50 cts. per ft., 8-in. sewer at 55 cts., 10-in. sewer at 50 cts., 12-in. sewer at 50 cts., total \$4,791; for sewage disposal plant at \$4,500. Extra for rock excavation \$8 per cu. yd., manholes \$35 each. A. Nape is Village Clerk.

Sparta, Wis.—For 8 1/2 ft. 8-in. sewer, 3 manholes, 13.4 in. Y's complete as follows: M. E. Putnam, at \$559.80; Schneider Bros., at \$486; N. F. Palan at \$478; W. D. Graves at \$435.65. W. H. Elyton is City Clerk.

Superior, Wis.—*S. A. Riches & Son, for sewer at \$9,641.30. Other bidders were: Pastoret & Co., \$9,734.23, and Magnus Peterson, \$9,984.01.

Waukesha, Wis.—*Paul Peterson for vitrified pipe sewer at following bid: 1,864 ft. 19-in. sewer at 77 cts., 242 ft. 8-in. sewer at 69 cts., 5 manholes at \$27, 2 lantern holes at \$8, total bid \$1,753.26. Y & T branches included in bid per foot. Extra for rock excavation \$3 per cu. yd. Wm. Powrie is Engr.

WATER SUPPLY

Waterbury, Conn.—Board of Public Works has decided to reject all bids for construction of water mains as being excessive. It was decided to have superintendent of water department build main ordered in Aurora St., and put all others which have been ordered into one contract and have city advertise for bids on entire job.

Delaware City, Del.—Plans are being discussed for better water supply system.

Edenburgh, Ill.—Residents are discussing plans for installation of water works system.

Ottawa, Ill.—City Clerk Curtis has been authorized to advertise for bids for 12 tons of 6-in. and 25 tons of 4-in., Class C cast-iron water pipe to be used for water main extensions.

Waukegan, Ill.—Commissioner Orvis has recommended installation of universal water meters in city.

Hartford City, Ind.—Board will call for bids June 5 for construction of water system at county infirmary.

Kokomo, Ind.—Mayor has recommended extension of water mains.

Hampton, Ia.—Citizens have voted in favor of installation of 100,000-gal. elevated tank for better fire protection.

Louisville, Ky.—Ordinance has been approved for fire hydrant in Maple St.

Williamstown, Ky.—Question of installation of water works is being discussed.

Presque Isle, Me.—Presque Isle Water Co., contemplates expenditure of \$5,500 for improving system.

Boston, Mass.—It has been decided by Mayor Curley that no architect will be employed by city to draw plans and superintend construction of new high-pressure pumping station, if War Department approves location selected on Charles River Basin. Richard A. McNulty, engineer of public works department, has drawn tentative plans for building. With slight changes they will be entirely acceptable to Mayor. It is announced that, with building costing \$150,000, city would save \$9,000 by having work done by its own force.

Foxboro, Mass.—Town has appropriated \$11,000 for extension of water service. Commissioners have been instructed to extend mains through six streets.

Lowell, Mass.—See "Miscellaneous."

Pittsfield, Mass.—Council has referred order calling for appropriation of \$15,000 for water extensions to finance committee.

Wenham, Mass.—Town considering extension of water system.

Detroit, Mich.—See "Sewerage."

Flint, Mich.—Petition for water main in Stevenson St. referred to water board.

Sault Ste Marie, Mich.—See "Streets and Roads."

McKinley, Minn.—Improvements here, including construction of complete new water system, all of which, it is esti-

mated, will cost \$40,000, will be started as soon as preliminary survey work by Engineer C. A. Kimball is completed. There will be 6,000 ft. of water mains laid, one mile of sidewalks built, and one-half mile of street graded, according to specifications now in hands of the engineer. For water supply it is planned to drill two or more wells south of village, where pumphouse will be constructed, electric-driven pumps installed, and steel tank of 100,000 gals. capacity erected. Village will issue call for bids for drilling wells at once. Bonds covering new water supply system were authorized to be issued by council as soon as work is completed.

Lodi, N. J.—Resolutions introduced by fire and water committee recommending purchase of 25 Lambert meters, and for adoption of card system showing cost and equipment of water department.

Binghamton, N. Y.—Common Council unanimously voted down ordinance authorizing issuance of \$160,000 worth of bonds to purchase Rockbottom dam.

Lyons, N. Y.—See "Miscellaneous."

Yonkers, N. Y.—Ordinance has been adopted directing laying of mains in Amberson Ave. a distance of 720 ft.; in Ellsworth Ave. 765 ft.; in Clifton Ave., 360 ft., and in Stanton Ave. a distance of 310 ft.

Yonkers, N. Y.—Aldermanic committee on police, fire and water will consider plans for elimination of high service station of water bureau on Lake Ave. Purchase of three million gallon pump at cost of about \$12,000 has been recommended for tube well station in Nepperhan Ave.

Salisbury, N. C.—New water system will get its supply from Yadkin River some six miles north of city and Engineer Ludlow of Winston has been instructed to complete all plans for new system. When this system is installed, Salisbury will have water supply of 3,000,000 gals. daily.

Wilkesboro, N. C.—Citizens will vote June 20 on \$15,000 bonds for water system.

Clinton, Okla.—Election on \$150,000 water bond issue will be held in Clinton, May 29.

Meadville, Pa.—Proposed bond issue of \$63,000 will be used for making extensive improvements to water works system.

Monaca, Pa.—Town contemplates construction of second reservoir.

South Bethlehem, Pa.—Water mains will be laid in Elmwood Park.

Windsor, Pa.—Citizens voted in favor of \$20,000 bond issue for water system.

Greeneville, Tenn.—W. W. Willis & Co. of Knoxville purchased the \$9,000 water extension bonds voted on April 25th, and \$27,000 street improvement bonds, at par and accrued interest.

Coolidge, Texas.—In special election held here bond issue of \$16,000 for waterworks carried by majority of three to one. City has large lake that will furnish an abundant supply, and will rush waterworks to completion as soon as bonds are sold.

Dallas, Tex.—N. M. Ehlers, State Sanitary Engineer, has recommended construction, of municipal filtration plant.

Terrell, Texas.—At recent meeting of city commission and citizens of Terrell, Terrell Bartlett of San Antonio was employed as civil engineer to make general examination of city's pumping plant, analyze operating and fixed costs and revenues of present plant, and make recommendations for increasing water supply of Terrell.

Salt Lake City, Utah.—Storage reservoir will be built this fall by St. George & Santa Clara Bench Irrigation Co., according to Amos S. Gabbott, chairman of state board of equalization, who is interested in company.

Summit, Utah.—Reported that town contemplates installation of municipal water system.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates contract awarded.)

Gadsden, Ala.—By Dwight Manufacturing Co., for addition to water plant: *C. O. Duncan.

Chicago, Ill.—*Daniel Hardin for installing water service pipes in several streets. *David Walsh for water service pipes.

Bowling Green, Ky.—For sedimentation basin: *M. J. Moore, Hopkinsville, at \$6,450. A. J. Wilkins is City Engineer.

Louisville, Ky.—For furnishing 35 hydrants: *K. A. Barker, Louisville, and 5 hydrants, *A. P. Smith Mfg. Co., East

Orange, N. J. D. R. Lyman is city engineer.

Boston, Mass.—For laying water pipes in West Roxbury, lowest bidders were: *M. De Sisto, at \$1,749.85; John Guarino, \$1,827.11; Anthony Baruffaldi, \$1,906.05; Vincenzo Grande, \$2,015.43. Engineer's estimate, \$2,640.

Boston, Mass.—For excavating and refilling trenches and openings, setting and regulating boxes, establishing hydrants, gates, etc., in a portion of District No. 2: *Thomas Burke, at \$14,306.25; John A. Costello & Co., \$16,559; John F. Lynch, \$16,595; Anthony Baruffaldi, \$18,558; John T. Shea, Jr., \$24,452.50. Engineer's estimate, \$15,000.

Boston, Mass.—For excavating and refilling trenches and openings, setting and regulating boxes, establishing hydrants, gates, etc., in District No. 1: *Thomas Burke, at \$6,799.25; John A. Costello, \$6,965.50; John F. Lynch, \$7,088.87; Anthony Baruffaldi, \$8,070.50; Vincenzo Grande, \$8,371.50; John T. Shea, Jr., \$8,519.50. Engineer's estimate, \$8,490.

Eveleth, Minn.—For installing water line: *Lawrence-McCann Co., \$10,300.25; Ephraim Johnson & Co., \$10,567.45; Risberg & Marvick, \$10,920.80; Pastoret Construction Co., \$12,278.90.

New York, N. Y. (Borough of Manhattan and Bronx).—For furnishing, delivering and laying water mains and appurtenances in Broadway, Amsterdam and Columbus Ave., Cathedral Parkway and in West 106th St., *Santor Construction Co., 234 West 41st St., Manhattan, at \$55,259.

Peekskill, N. Y.—For laying water pipes: John Smith, Jr., \$2,965.60; Croton Contracting Co., \$2,994.40; Benkart & Russo, \$3,015.70; D. D. Donovan, \$3,132.80; W. J. Donovan, \$3,336; Patsy Repole, \$3,423.90; H. B. Sproul Contracting Co., \$3,973.41, and Peekskill Construction Co., \$4,750.50.

Rochester, N. Y.—For furnishing, hauling and laying about 9½ miles of steel water main, part of Conduit 3: *T. A. Gillespie Co., for \$412,030.

Portland, Ore.—*Gamon Meter Co., Newark, N. J., for supplying 850 ¾-in. water meters at \$6.50. Other bidder was Badger Meter Mfg. Co., Milwaukee, Wis., at \$6.95. J. R. Wood is Purchasing Agent.

Erie, Pa.—For a 100 horsepower boiler to furnish steam for pumping engine to drain basins on peninsula: *Erie City Iron Works, at estimated cost of \$1,285. *Morris Machinery Co. of Baldwinsville, for pumping apparatus, at a cost of \$1,377.

Fort Worth, Tex.—*Lock Joint Pipe Co., Ampere, N. J., for completing Lake Worth conduit at \$135,000.

Mount Horeb, Wis.—*C. H. Phillips, Waupaca, Wis., for laying 7,345 of 6-in. water pipe at 35 cts. per ft., 1,818 ft. 4-in. pipe at 30 cts. per ft.; total \$3,116.15. A. Nape is Village Clk.

MISCELLANEOUS.

Phoenix, Ariz.—Plans by which state may erect an immense irrigation project, under law which permits it to engage in such development, were revealed in notice that commissioner of land office had ordered withdrawn 17,000 acres in Maricopa county.

Anderson, Cal.—Directors of Anderson-Cottonwood Irrigation district have rejected bids covering the dam, Churn Creek siphons and some laterals or excavation work. New bids will be advertised for.

Gridley, Cal.—City trustees of Gridley, Butte county, decided to call a bond election for \$5,500 for the purchase of ground for a city park.

Los Angeles, Cal.—Council has adopted report of public works committee, recommending adoption of ordinance for drawing of plans and specifications for Second St. bore, and an ordinance for submission of a \$300,000 bond issue to help defray cost of tunnel.

Orland, Cal.—A \$7,000 civic center bond issue voted by people of Orland, Glenn County, sold in San Francisco at \$260 above par, insuring immediate purchase of proposed site.

Pueblo, Colo.—Advisory committee and City Commissioners have selected plans for new city hall, drawn by Will Stickney, local architect. Cost of building is set at \$225,200.

Washington, D. C.—Brick and tile

manufacturer in Far East informs an American consular officer that he desires to communicate with American manufacturers of brick and tile machinery. It is stated that payments will be made against documents in New York. (No. 21,103).

Indianapolis, Ind.—Ordinance is being considered authorizing \$68,000 bond issue for flood prevention work.

Indianapolis, Ind.—Board of park commissioners is discussing plans for building of operating plant at Garfield park to house all repair departments of all parks of Indianapolis. It is estimated that plant will cost about \$5,000. James H. Lowry is superintendent of parks.

Lexington, Ky.—City will sell bonds for park purposes.

New Orleans, La.—The \$1,000,000 of 6 per cent. bonds of supervisor's District No. 2 of Jones county, Mississippi (which includes city of Laurel), have been awarded to Hibernia Bank & Trust Co., of New Orleans, at a premium of \$7,281.

Haverhill, Mass.—City will purchase Ford automobile with delivery body for engineering department.

Haverhill, Mass.—Council has voted to purchase three Ford automobiles for city departments.

Lowell, Mass.—Bids on 4 per cent. city bonds, \$60,000 for school additions and improvements, \$55,000 for water mains and equipment, \$61,000 for macadam and paving, and \$8,000 for sidewalks have been received by city treasurer and commissioner of finance. All bids came from Boston. E. H. Rollins & Co. was highest bidder, and Commissioner Duncan said that premiums will amount to over \$1,500. The bids were as follows: E. H. Rollins & Son, 100,889; R. L. Day & Co., 100,846; Harris Forbes & Co., 100,084; Adams & Co., 100,067; Blodgett & Co., 100,063; Arthur Perry & Co., 100,052; Curtis & Sanger, 100,051; Cropley, McGargle & Co., 100,0174; Esterbrook, 100,011.

Pittsfield, Mass.—Police committee of City Council at a meeting recently voted to buy a Kissel Kar for police department of F. C. Goodrich. The price will be \$1,200 and agent will also get old Buick car in addition to this price. It was also voted to buy Harley Davidson motorcycle of Joseph Foizle at price of \$300.

Waltham, Mass.—Mayor will ask board of aldermen for appropriation to provide for purchase of auto truck for wires department.

St. Paul, Minn.—Sealed proposals will be received May 22 for furnishing public official bonds for six commissioners of city, said bonds to run for a period of two years, beginning June 5, 1916, as follows: Com. of finance, \$200,000; com. of public works, \$10,000; com. of public safety, \$10,000; com. of public utilities, \$10,000; com. of education, \$10,000; com. of parks, playgrounds and park buildings, \$10,000. August Hohenstein is purchasing agent.

Gulfport, Miss.—Board of supervisors passed an order authorizing issuance of \$125,000 bonds for purpose of aiding in establishment and maintenance of Mississippi Centennial Exposition to commemorate 100th anniversary of Mississippi as a state.

Butte, Mont.—Special committee will recommend to City Council that incinerating plant proposed by De Carle Co. of Minneapolis be purchased at cost of \$40,800.

Bayonne, N. J.—City Commissioners have voted \$5,000 for shore development.

Elizabeth, N. J.—See "Streets and Roads."

New Brunswick, N. J.—Ordinance has been adopted providing for \$40,000 bond issue for purchase, remodeling and furnishing of Cogswell property for use as city hall.

Perth Amboy, N. J.—Plans are being discussed for improvement of parks in the near future.

Lockport, N. Y.—Plans being discussed for placing Darrison Park in proper condition for public market.

Lyons, N. Y.—Following propositions carried at recent election: To raise sum of \$3,000 for general fund; \$3,000 for a police fund; \$1,800 for fire fund; \$350 for extra fire fund; \$400 for park music fund; \$4,000 for a street fund; \$10,876 to pay interest on water and sewer bonds; \$3,000 for a hydrant fund; \$3,000 for operation of sewers; \$750 for light fund.

Rochester, N. Y.—Plans being discussed for doubling capacity of incinerating plant, at cost about \$40,000.

Ogdensburg, N. Y.—Board of Health

considering plans for installation of garbage collection system.

Providence, R. I.—Over \$160,000 will be hired by city immediately, Board of Aldermen passing resolutions which had already received sanction of lower branch of City Council. Of this money \$52,436.65 will be used to meet State tax, \$100,000 is to be added to money available for construction of sewers and \$12,500 will be given to the Board of Police Commissioners to be used in completing motorization of the department.

Charleston, S. C.—Plans being discussed for improvement of Ashley River at cost of about \$100,000.

Galveston, Tex.—New plans are being considered for building open arches for causeway. Engineer Merritt said that in view of desire to build all new arches with full free waterway, and to tear out sheet piling, new arches might be of a uniform span—that is, not as formerly agreed, some 70-ft. and some 50-ft. arches. Engineers still hope to keep the cost of rehabilitation within \$1,500,000.

Spokane, Wash.—Ferris & Hardgrove, investment bankers, have purchased \$45,000 worth of Flathead county, Montana, municipal district bonds of Ashley Irriga-

tion district situated near Kallispell. Bonds, which fall due \$2,500 each year from 1920 to 1939, bear 6 per cent interest and are in denominations of \$100.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contract Awarded.)

Indianapolis, Ind.—*Jackson Machine Co. for grader engine hitch at \$260 each, J. D. Adams & Co. for scarifier engine hitch at \$525 each.

Council Bluffs, Ia.—*Frank A. Merke, Joliet, Ill., for garbage disposal for period of 5 years at \$200 a month the first year, \$150 a month the second year, and \$100 a month remaining three years.

New Brunswick, N. J.—*Newton B. Smith, local, for motor-driven garbage truck, at \$4,800.

Roselle, N. J.—Bids for contract for collection of garbage were as follows: Matthew Wade, Jr., \$2,000 for 300 days' work; Joseph Wade, \$6.75 per day; T. Foster Callahan, \$8.90 per day; D. M. Perrine, \$7.50 per day; L. Anthony, \$2,300 for 300 days' work; Antonio Vich, \$8 per day; E. C. Wright, \$2,750 for 300 days' work; Robert Lyons, \$7.50 per day; F.

Capone, \$2,000 for 300 days' work; A. Keeler, \$2,000 for 300 days' work; John Bosely, \$7.75 per day, and from C. H. Thompson, \$1,950 for 300 days' work. Bidders agreed to furnish team, wagon and two men for work.

Buffalo, N. Y.—H. S. Kerbaugh, Inc., Buffalo, was lowest bidder at \$23,030 for dredging government channel entrance to Erie Basin and Black Rock harbor. Mr. Kerbaugh put in bid of 24½ cts. per cu. yd. for removal of 94,000 cu. yds. Other bidders were: Great Lakes Dredge & Dock Co., of this city, \$25,004, at rate of 26 6-10 cts. per yd., and James Stewart & Co., of New York, \$51,000, at rate of 55 cts. per yd.

Schenectady, N. Y.—*Anchor Post Iron Works of New York for fence to be built around garbage reduction plant at \$765. *George H. Thacher Co., of Albany, for supplying shaking grates for boilers at garbage reduction plant at a cost of \$450.

El Paso, Tex.—For construction of county poor farm building were as follows: Beaudett & Cooper for \$13,967; Pitts & Denning, \$14,250; Nic Muriale, \$14,170; W. H. Eubank, \$16,176; Jolly & Morris, \$15,613.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
Pa.	Renovo	5 p.m., May 22	Constructing 2,000 sq. yds. brick pavement	F. E. Colony, Boro. Engineer.
Ill.	Peoria	2 p.m., May 22	Laying concrete alleys and sidewalks	Bd. of Local Improvements.
Neb.	Fremont	2 p.m., May 22	Grading 3½ miles of road	Alvin O'Connor, Clerk.
Ia.	Centerville	8 p.m., May 23	15,500 sq. yds. pavement and 10,800 ft. of curb	M. G. Hall, Engineer.
Ia.	Knoxville	May 23	Paving several streets	City Clerk.
Mass.	Boston	noon, May 23	18,000 ft. state highway (two jobs)	Mass. Highway Commission.
Ill.	Bartonville	8 p.m., May 25	13,420 sq. yds. concrete pavement and 10,513 cu. yds. excavation	Bd. of Local Improvements.
Minn.	Minneapolis	May 26	Concrete and gravel road, cost \$58,000.	County Commissioners.
N. Y.	New Brighton	noon, May 26	700 sq. yds. bit. macadam pavement and 2,625 sq. ft. side walk, with curb, etc.	C. D. Van Name, Boro. Pres.
Minn.	St. Paul	10.30 a.m., May 29	Grading and constructing cement curb; furnishing 300 tons asphaltic cement	August Hohenstein, Pur. Agt.
Wis.	Superior	1.30 p.m., May 29	Paving with asphalt, brick or concrete	Board of Public Works.
Pa.	Wilkes-Barre	2 p.m., May 31	Constructing 3.2 miles county highway	Engineer of Roads & Bridges, Court House.
Mont.	Billings	2 p.m., May 31	Grading, draining and hard surfacing 47 miles of road	S. E. Williams, Co. Clerk.
Minn.	Minneapolis	June 1	1.1 mile concrete road, cost \$14,000	County Clerk.
Wis.	West Allis	June 5	Grading and paving with concrete	Board of Public Works.
N. D.	Larimore	7 p.m., June 5	Constructing sidewalks and curbs during 1916	N. J. Powell, City Auditor.
Neb.	Papillion	noon, June 6	Constructing concrete walks and culverts during 1916	G. F. Oliver, Village Clerk.
Cal.	Stockton	10 a.m., June 6	Improving 2.5 miles of road	E. D. Graham, Clk., Co. Supvrs.
Ind.	Indianapolis	10 a.m., June 8	Improving county road	L. K. Fesler, Co. Auditor.
Wis.	Janesville	2 p.m., June 13	14,458 sq. yds. asphalt macadam and 3,000 cu. yds. excavation	City Clerk.
SEWERS.				
Minn.	Springfield	7.30 p.m., May 22	1,175 ft. 8-inch sewer	E. J. Fernholz, Village Rec.
Minn.	Mapleton	7.30 p.m., May 23	Disposal plant, sludge bed and 850 feet 8-inch sewer	Andrew Kaufman, Vil. Rec.
Minn.	Waseca	8 p.m., May 23	Constructing tile drains	John Madigan, City Clerk.
Minn.	Fairmont	8 p.m., May 26	4,900 feet of sewers	F. O. Jones, City Engr.
Ia.	Webster City	11 a.m., May 26	Constructing tile drain, cost \$35,450	G. L. Mechem, Engineer, Clarion, Ia.
WATER SUPPLY.				
Washington, N. Yak.	2 p.m., May 20	9,140 ft. 30 and 40-in. wood stave pipe near Grandview	U. S. Reclamation Service.	
N. D.	Fargo	10 a.m., May 24	2,470 ft. 6-in. and 3,176 ft. 10-in. mains and 12 hydrants	A. R. Watkins, City Auditor.
Neb.	Overton	1 p.m., May 25	Constructing water works and supply system	J. W. Dunnaway, Village Clk.
Minn.	Fairmont	8 p.m., May 25	Laying 1 mile 4-in. water mains	A. Horne, Supt. Water & Lt.
Minn.	St. Paul	10.30 a.m., May 29	Constructing addition to pumping station	August Hohenstein, Pur. Agt.
Neb.	Platte Center	10 a.m., June 5	Extending water mains	S. B. Allen, Village Clerk.
Wis.	East Troy	7 p.m., June 5	Laying 2,000 ft. 4-in. pipe and 5 hydrants	O. R. Kurzrok, Village Clk.
MISCELLANEOUS				
Minn.	St. Paul	10.30 a.m., May 28	Three 2-passenger automobiles	August Hohenstein, Pur. Agt.
S. D.	Highmore	June 6	One elevator grader	L. W. Carter, Co. Auditor.

STREETS AND ROADS

Stockton, Cal.—Calaveras County contemplates bond election for good roads.

Wilmington, Del.—County will borrow \$5,000 for repairs on stone roads.

Chicago Heights, Ill.—Plans are being made for opening up Euclid Ave.

Peoria, Ill.—Ordinance has been adopted calling for paving McClure Ave. from Pacific St. to Elizabeth St. to width of 37½ ft.

Goshen, Ind.—Within a short time Bd. of Commissioners of Elkhart County will award contract for construction of about 6 miles of brick pavement over Lincoln Highway route.

Hartford City, Ind.—Atkinson Road will be built of asphalt, and work will start shortly.

Atchison, Kans.—Commissioners have decided to readvertise for macadamizing of road to B. P. Waggener farm, a distance of about 7,200 ft., work to be advertised and contracts let in two sections. This road was advertised before, and bid of \$7,760 accepted, but it was learned then that, as distance was over a mile, it would be necessary to readvertise it in two sections to make it conform with law.

Atchison, Kans.—County contemplates expenditure of approximately \$37,000 for road improvement.

Litchfield, Ky.—Voters of Grayson County will have chance to vote on proposition to issue road bonds amounting to \$175,000 June 3. If this carries, the work will be done under state-aid plan.

Lexington, Ky.—Petition has been presented to Council asking for asphalt pav-

ing with concrete sidewalks on Arceme Ave. Petition referred to Commissioner of Public Works.

Shelbyville, Ky.—City closed contract with Indiana Refining Co. for 15,000 gals. of road oil, to be delivered not later than May 20. Oil will be applied on streets as soon as received.

Walton, Ky.—Boone County has voted in favor of \$200,000 bond issue for good roads.

Baton Rouge, La.—The East Baton Rouge Police Jury was petitioned to appropriate \$35,000 as supplement to \$100,000 bond issue by that ward for additional good roads. Committee was appointed to look into matter and make a report at next meeting of the jury. The Third Ward will be completely equipped with model roads, if proposition goes through.

New Orleans, La.—Bids will be received

until June 7 at Court House in Mansfield, La., for \$250,000 road bonds of District No. 4 of De Soto Parish, La. G. Williams is Secy.

Lynn, Mass.—Work will start shortly on macadamizing several streets about town.

Saugus, Mass.—Board considering plans for constructing permanent streets.

Eveleth, Minn.—Plans are being discussed for concrete highway to connect this city and Virginia. Engineers of the two cities—Ed. Johnson, of Virginia, and C. M. Dorway, of Eveleth—were instructed to work together on survey of proposed route and prepare blueprints for Councils to consider at later joint meeting.

Joplin, Mo.—Commissioners have recommended use of vertical fibre brick in paving Main St.

Kansas City, Mo.—Forty-six street repair ordinances, recommended by special crew of inspectors who have inspected all city streets, were passed by both houses of the Council May 8. Forty-six more were held in lower house. Sixty more ordinances will be introduced shortly.

Marshall, Mo.—Plans are being made for another permanent road campaign in Saline County.

Elizabeth, N. J.—Ordinances have been approved calling for improvement of several streets at approximately \$298,000.

Elizabeth, N. J.—Street Commissioner has been authorized to publish notice of intention to pave Front St. from E. Jersey St. to Elizabeth River, with granite block on concrete foundation.

Elizabeth, N. J.—Bids have been received for street improvements aggregating more than \$100,000. Appropriations for this work have already been made by City Council. Bids were referred to Committee on Streets, and contracts will be awarded at next meeting of Board. Ordinances providing for repaving of a number of streets were passed upon first and second readings. Resolutions were adopted directing Street Commissioner to publish notice of intention. Board will hold public hearing May 23. City Council has authorized a bond issue of \$279,000 to pay for work, which it is proposed to do under "fifty-fifty" plan.

Glen Ridge, N. J.—Council will ask for bids for paving Ridgewood Ave. with concrete early in July, and engineer will be engaged to supervise laying of concrete.

Albany, N. Y.—Mayor Stevens has approved these ordinances: For repaving Central Ave. from Lark to Quail St.; appropriating \$281.80 for repairs to Albany City-Central Ave. highway; for improvement of Morris St. from Robin St. westerly about 265 ft.; for grading of Park Ave. from S. Lark Ave. to Quail St.; for improvement of Park Ave. between S. Lark Ave. and Quail St.; fixing and establishing the grade of Ave. B from Seneca St. easterly about 253 ft.; for sewer under the carriageway of Ave. B from Seneca St. easterly about 250 ft., and accepting Ave. B from Seneca St. easterly about 253 ft. as a public street.

Brooklyn, N. Y.—See "Sewerage."

Hudson, N. Y.—Plans are being discussed for paving Warren St. for a distance of about 200 ft.

Jamestown, N. Y.—Chautauqua County Supervisors have approved plans prepared by state for improvement, on state and county plan of payment, of three strips of highways, costing \$226,100, of which the county's share is \$66,690.

Winston-Salem, N. C.—Property owners have provided funds for construction of concrete road between Clemmonsville and Lewisville Rd. and the Country Club.

Columbus, O.—Sealed proposals will be received here until June 5 for road improvement bonds in sum of \$81,500. John Scott is Clerk of the Board.

Marietta, O.—Asphalt tar-bound macadam is material decided upon by County Commissioners to be used in construction of Athens-Marietta Inter-County Highway No. 157 and Marietta-McConnellsville Inter-County Highway No. 393.

Portland, Ore.—Plans being considered for improving Powell St. with hard surface pavement from Milwaukee St. to 21st St.

Lebanon, Pa.—Commissioners have decided to repair highway between Dunkard's Meeting House and Kauffman's.

Montpelier, Vt.—Finance Committee will appropriate following amounts: Streets, \$19,134.83; sidewalks, \$6,000; sewers, \$3,500; state roads, \$4,000; fire department, \$8,000; police, \$4,600; street lighting, \$9,000.

Portsmouth, Va.—Two bids received for construction work on boulevard lead-



The Kingdom of the Subscriber

In the development of the telephone system, the subscriber is the dominant factor. His ever-growing requirements inspire invention, lead to endless scientific research, and make necessary vast improvements and extensions.

Neither brains nor money are spared to build up the telephone plant, to amplify the subscriber's power to the limit.

In the Bell System you have the most complete mechanism in the world for communication. It is animated by the broadest spirit of service, and you dominate and control it in the double capacity of the caller and the called. The telephone cannot think and talk for you, but it carries your thought where you will. It is yours to use.

Without the co-operation of the subscriber, all that has been done to perfect the system is useless and proper service cannot be given. For example, even though tens of millions were spent to build the Transcontinental Line, it is silent if the man at the other end fails to answer.

The telephone is essentially democratic; it carries the voice of the child and the grown-up with equal speed and directness. And because each subscriber is a dominant factor in the Bell System, Bell Service is the most democratic that could be provided for the American people.

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AND ASSOCIATED COMPANIES

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ing to Meadowbrook entrance were considered excessive for bituminous macadam work and were referred to State Highway Commissioner for consideration.

Janesville, Wis.—City Council considering plans for paving of several streets.

Bids Received and Contracts Awarded.

(*Indicates contract awarded.)

Saginaw, Mich.—Cleveland Trinidad Co., lowest bidder for paving State St., at \$16,284.75.

Columbus, Miss.—*J. D. & J. F. Blankinship, North Carolina contractors, for road work in District No. 1 of Jackson Military Highway, at \$18,000.

Caledonia, Mo.—*Mulvill Bros., Alton, Ill., for 13 miles of roadbed and gravel surface. W. R. Heagler & Sons, Potosi, Mo., Engrs.

Madison, N. J.—For about 5,200 sq. yds. asphaltic block pavement, with 4-in. concrete foundation, about 2,000 cu. yds. clay and hardpan excavation, as follows: Osborn & Marsellis, Morristown, N. J., base, 72 cts.; block, \$1.57; excavation, 50 cts. Gray Const. Co., Morristown, 63 cts., \$1.53, and 54 cts., respectively; *Hastings Pavement Co., New York City, 56 cts., \$1.55, and 55 cts., respectively. Geo. W. Gardner is Boro. Engr.

Albany, N. Y.—John Shaw and Irving Taylor, of Waterford, submitted lowest bid, at \$3,210, for contract for improving highway between Mohawk River and Old Erie Canal at Forts Ferry, Saratoga County.

Bath, N. Y.—*Kennedy Const. Co., of Albany, for repairing a total of 63.12 miles of state road in Steuben County, at \$26,517.97.

Binghamton, N. Y.—For paving as follows: Conklin Ave.—Warren Bros., sheet asphalt, \$2.24; bitulithic, \$2.29; concrete curb, straight, 70 cts. ft.; removing trees, \$25; crosswalk plates, \$14; sub-drains, 25 cts. a lin. ft. Sewage Disposal & Water Plant Co., concrete, \$1.55; brick, \$2.24; curbing, 71 cts. ft.; removing trees, \$1 each; crosswalk plates, \$15.80; sub-drain, 40 cts. ft. Frank Stento, concrete, \$1.36; brick, \$2.08; removing trees, \$10 each; crosswalk plates, \$15 each; sub-drains, 4 cts. ft. Geo. Serafini, concrete, \$1.38; brick, \$2.12; removing trees, \$8 each; crosswalk plates, \$15; sub-drains, 10 cts. ft. Langan Const. Corp., Mexican asphalt, \$2.05; removing trees, \$10 each; crosswalk plates, \$16; sub-drains, 25 cts. ft. Tyne & Willey, concrete, \$1.85; brick, \$2.25; curbing, 70 cts. ft.; removing trees, \$5 each; crosswalk plates, \$20; sub-drains, 25 cts. ft.

Whitney Ave. and Montgomery St.—Frank Stento, concrete, \$1.40; brick, \$2.05; removing trees, \$10 each; sub-drains, 10 cts. ft. Geo. Serafini, concrete, \$1.36; brick, \$2.00; removing trees, \$8 each; sub-drains, 10 cts. ft. Warren Bros., concrete, \$2.24; bitulithic, \$2.29; removing trees, \$5 each; sub-drains, 25 cts. ft. Sewage Disposal & Water Plant Co., concrete, \$1.58; brick, \$2.26; removing trees, \$1 each; sub-drains, 40 cts. ft. Tyne & Willey, concrete, \$1.80; brick, \$2.25; removing trees, \$5 each; sub-drains, 25 cts. ft.

Robinson St. from Gaylord to Fairview Ave.—Frank Stento, concrete, \$1.40; brick, \$2.07; curbing, 50 cts. ft.; catchbasins, \$85 each; crosswalk plates, \$15; sub-drain, 10 cts. ft. Geo. Serafini, concrete, \$1.37; brick, \$2.05; curbing, 50 cts. ft.; catchbasins, \$80; crosswalk plates, \$15; sub-drains, 10 cts. ft. Sewage Disposal & Water Plant Co., concrete, \$1.58; brick, \$2.24; curbing, 60 cts. ft.; catchbasins, \$78; crosswalk plates, \$15.80. Warren Bros., brick, \$2.20; asphalt, \$2.24; bitulithic, \$2.29; curbing, 57 cts. ft.; catchbasins, \$65; crosswalk plates, \$14. Tyne & Willey, concrete, \$1.80; brick, \$2.25; curbing, 60 cts. ft.; catchbasins, \$80; crosswalk plates, \$20.

Fayette St.—Frank Stento, concrete, \$1.37; brick, \$2.04; curbing, 48 cts. ft.; crosswalk plates, \$15. Geo. Serafini, concrete, \$1.38; brick, \$2.06; curbing, 48 cts. ft.; crosswalk plates, \$15. Tyne & Willey, concrete, \$1.80; brick, \$2.25; curbing, 60 cts. ft.; crosswalk plates, \$20. Sewage Disposal & Water Plant Co., concrete, \$1.55; brick, \$2.21; curbing, 60 cts. ft.; crosswalk plates, \$15.80. Warren Bros., asphalt, \$2.24; bitulithic, \$2.29; curbing, 57 cts. ft.; crosswalk plates, \$14 each. Langan Const. Corp., brick, \$2.05; curbing, 50 cts. ft.

E. Starr Ave.—Tawach & Chappell, reinforced concrete, \$1.85; curbing, 55 cts. ft.; sub-drains, 50 cts. ft. Frank Stento, reinforced concrete, \$1.37; curbing, 49 cts. ft.; sub-drains, 4 cts. ft. Geo. Serafini, reinforced concrete, \$1.38; concrete curbing, 48 cts. ft.; sub-drains, 10 cts. ft. I. S. Matthews Sons, concrete, \$1.85; curb, 52 cts. ft.

Fayette St., Henry to Lewis.—Tyne & Willey, concrete, \$1.80; brick, \$2.25; plastering rails, 2 cts. ft. Sewage Disposal & Water Plant Co., brick, \$2.49; plastering rails, 3 cts. ft. Warren Bros., brick, \$2.20; plastering rails, 2 cts. ft. Geo. Serafini, concrete, \$1.38; brick, \$1.95; plastering rails, 2 cts. ft. Frank Stento, concrete, \$1.35; brick, \$1.60; plastering rails, 2 cts. ft.

Harrisburg, Pa.—Bids received for Section 2 of State Highway Route 131, Aston and Concord Townships, Delaware County, called for reinforced cement concrete pavement, 3.64 miles. Bids were as follows: Dwyer & Co., Philadelphia, \$68,535.21; Neff, Horn & Co., Slatington, \$79,273.40; Juniata Paving Co., Philadelphia, \$81,440.41.

For Section 4, State Highway Route 131, Birmingham Township, Delaware County, for construction of reinforced cement concrete, or bituminous and reinforced concrete pavement, 2.75 miles. Bids received were as follows: Newton Paving Co., Philadelphia, \$51,908.27; Chas. T. Eastburn Co., Inc., Yardley, \$60,726.61; Wm. C. Evans, Ambler, Pa., \$61,608.72; B. F. Wickersham, Kennett Square, \$56,667.83; Juniata Paving Co., Philadelphia, \$50,192.61; Eastern Paving Co., Philadelphia, \$64,093.34.

For Section 5, on State Highway Route 131, Pennsbury and Kennett Townships, Chester County, for construction of reinforced cement concrete, or bituminous and reinforced cement concrete pavement, 3.37 miles. Bids received were as follows: Chas. T. Eastburn Co., Inc., Yardley, \$74,432.38; Newton Paving Co., Philadel-

phia, \$64,300.63; Eastern Paving Co., Philadelphia, \$76,851.54; Juniata Paving Co., Philadelphia, \$64,743.13; Corcoran Const. Co., West Chester, \$62,492.54; Wm. C. Evans, Ambler, Pa., \$68,057.52.

On Section 7, Route 131, in London Grove and Penn Townships, Chester County, the bids received called for reinforced cement concrete, or bituminous and reinforced cement concrete pavement, 1.96 miles. Bids received were as follows: Chas. T. Eastburn Co., Inc., Yardley, \$54,325.66; Parson Const. Co., Inc., Brownsville, \$55,494; D. E. O'Connell & Sons, Avondale, \$44,255.73; Juniata Paving Co., Philadelphia, \$47,698.75; Eastern Paving Co., Philadelphia, \$55,189.90; R. B. Taylor, Bellefonte, \$45,744.71; Wm. C. Evans, Ambler, Pa., \$51,441.72.

Bids on State-aid Application 563, in Whitemarsh Township, Montgomery County, called for construction of 0.83 mile of bituminous construction. Bidders were privileged to select either: Class A, sheet asphalt; B, Filbertine; C, Warrenite; D, Amiesite. The names of the bidders and the class which they bid on follow: Paul J. Snyder & Co., Philadelphia, Class D, \$15,912.48; Newton Paving Co., Philadelphia, Class A, \$16,112.39; Dwyer & Co., Philadelphia, Class C, \$17,954.05; Chas. T. Eastburn Co., Inc., Yardley, Class D, \$16,586.60; Eastern Paving Co., Philadelphia, Class A, \$17,877.59; Wm. C. Evans, Ambler, Class B, \$17,239.50; J. F. Shanley Co., Philadelphia, Class D, \$18,521.86; Parson Const. Co., Brownsville, Class D, \$19,296.02.

On State-aid Application 407, in Nether Providence Township, Delaware County, a vitrified brick block pavement, 4,250 ft., or 0.8 mile, 18 ft. wide, was specified. This was only instance in which an 18-ft. pavement was requested, all others being the standard width of 16 ft. Bidders were as follows: Dwyer & Co., Philadelphia, \$21,686.52; Gillespie & Son, Oakville, \$24,217.35; Parson Const. Co., Brownsville, \$28,209.81; Gibbons & Buckley, Lansdowne, \$26,301.10; Paul J. Snyder Co., Philadelphia, \$26,915.88; Chas. T. Eastburn Co., Inc., Yardley, \$26,153.10; J. F. Shanley Co., Philadelphia, \$29,401.41; Field, Barker & Underwood, Philadelphia, \$27,469.02.

Two Rivers, Wis.—For asphalt macadam paving, penetration method, 8-in. base, 1,600 cu. yds. excavation, clay and sand, as follows: E. T. H. Third, Two Rivers, at \$1.09 per sq. yd. for paving, 46 cts. for curb and gutter—total, \$9,944.32; Walter O. Bahr, Manitowoc, Wis., at \$1.08 and 45 cts., respectively—total, \$9,817.02; Murphy Const. Co., Manitowoc, at \$1.07½ and 44½ cts., respectively—total, \$9,752.17. E. M. de Bruin is City Engr.

SEWERAGE

Lexington, Ky.—Ordinance authorizing Mayor to advertise for bids for construction of Forest Hill main sanitary sewer is being considered. Cost of work is estimated at \$4,000.

Elizabeth, N. J.—Ordinance has been approved appropriating sum of \$5,000 from general unexpended balance fund, to establish special fund to defray cost of making connections with sewer, gas and water mains, prior to time fixed for paving or repaving of any street, avenue or public thoroughfare within city.

Albany, N. Y.—See "Streets and Roads."

Brooklyn, N. Y.—Final authorization has been granted by Board of Estimate for the following improvements in Queens, for which bids will shortly be advertised: Paving with asphalt, for a width of 20 ft., Lefferts Pl., from Liberty Ave. to Rockaway Blvd.; estimated cost, \$20,000. Sewer in Maure Ave., from Atlantic Ave. to Wisner Pl.; estimated cost, \$12,400. Sewers in Woodmere Pl., from Freedom Ave. to Herald Ave., and in Oxford Ave., from Ridgewood Ave. to Fulton St.; estimated cost, \$6,100. Sewer in Kossuth Pl., from Myrtle Ave. to Central Ave.; estimated cost, \$1,400. Paving with asphaltic concrete for a width of 20 ft. Columbia Ave., from Queens Blvd. to Laurel Hill Blvd.; estimated cost, \$1,500. Sewer in Atlantic Ave., north side, from Freedom Ave. to Greenwood Ave.; Herald Ave., from Atlantic Ave. to Ridgewood Ave.; Fulton St., from Herald Ave. to Guion Ave., and in Napier Ave., from Atlantic Ave. to Jamaica Ave.; estimated cost, \$30,300. Preliminary authorization has been granted for the following improvements and the work of preparing the maps and the engineering work will start at once under the direction of Borough President Connolly: Sewer in 19th St., from Cypress Ave. to Franconia Ave.; estimated cost, \$1,800. Sewer in Centre

STREET IMPROVEMENT

City of Johnson City, Tennessee, Legal Notice.

Sealed proposals will be received at the office of the undersigned in the City of Johnson City, Tennessee, until 7.30 p. m., Tuesday, June 6, 1916, for constructing street paving with asphalt, asphaltic concrete, cement concrete or tarvia for Improvement Districts, Nos. 20, 21 and 23, according to plans and specifications in the office of the City Engineer. The city reserves the right to accept bids for separate districts, and to award paving, curb and gutter or sewers separately for each district.

Approximate Quantities

13,662 yds. paving, including grading.
11,226 lin. ft. curb and gutter.
3,850 lin. ft. 6-in. sewer connections.
1,500 ft. 8-in. vitrified sewer.
1,100 lin. ft. 12-in. vitrified sewer.
9 manholes.

Each bid must be accompanied by a certified check equal to ten per cent. of the amount of the bid as a guarantee of good faith of the bidder.

Bids asked for, are payable in 5½ per cent. bonds.

The right is reserved to reject any or all bids.

Bids will be opened at a regular meeting of the Board of Mayor and Aldermen, Tuesday, June 6th, 1916, at 7:30 p. m.

P. F. McDONALD,
City Engineer.

WM. R. POWDER, City Recorder.

PROPOSALS

Invitation to Bidders

SEALED BIDS will be received by the Board of Directors of the Street and Sewer Department, of the city of Wilmington, Delaware, at the office of said department, S. W. Corner Sixth and King Streets, until 4 o'clock P. M., May 31, 1916, for grading and excavating streets, constructing concrete foundations, constructing concrete and brick gutters and constructing Sheet Asphalt, Asphaltic Concrete, Bitulithic, Warrenite, Asphaltic Block and Vitrified Block Pavements on streets to be selected by the Street and Sewer Department from list published with the instructions and specifications for such work, which instructions and specifications, together with proposal blanks, may be obtained at the said office. Prices are to be for performing the said work in such amounts and kinds as may be directed by the Street and Sewer Department, to complete not less than 50,000 square yards of street surface. The bids will be publicly opened at the aforesaid time. The right is reserved to reject any or all bids or to accept any portions of the bids.

BOARD OF DIRECTORS OF THE STREET
AND SEWER DEPARTMENT.

Attest: HENRY C. TAYLOR,
Secretary.

TREASURY DEPARTMENT, Supervising Architect's Office, Washington, D. C., May 15, 1916.
—Sealed proposals will be opened in this office at 3 p. m., June 21, 1916, for the construction complete of the United States post office and custom-house at Douglas, Ariz. Drawings and specifications may be obtained from the custodian of site at Douglas, Ariz., or at this office, in the discretion of the Acting Supervising Architect, Jas. A. Wetmore, Acting Supervising Architect.

St., from Wyckoff Ave. to a point 400 ft. north; estimated cost, \$1,200. Sewer in Joslin St., from Larch Ave. to Queens Ave.; estimated cost, \$1,600. Grading Moore St., from Nelson Ave. to Queens Blvd.; estimated cost, \$2,800.

Springfield, O.—With only one bid submitted.
Montpelier, Vt.—See "Streets and Roads."